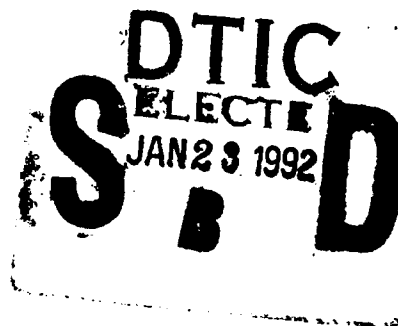


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THESIS

War as Art or Science: A Humanist Vision

by

Todd Richard Sears

December 1991

Thesis Advisor:

R. H. S. Stolfi

92-01668



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82 1 23 008

Unclassified

Security Classification of this page

REPORT DOCUMENTATION PAGE

Report Security Classification Unclassified		1b Restrictive Markings	
Security Classification Authority		3 Distribution Availability of Report Unlimited Distribution	
Declassification/Downgrading Schedule		5 Monitoring Organization Report Number(s)	
Name of Performing Organization Naval Postgraduate School		6b Office Symbol (If Applicable) (Dept. 38)	
7a Name of Monitoring Organization Naval Postgraduate School		7b Address (city, state, and ZIP code) Monterey, CA 93943-5000	
Address (city, state, and ZIP code) Monterey, CA 93943-5000		9 Procurement Instrument Identification Number	
Name of Funding/ Sponsoring Organization		8b Office Symbol (If Applicable)	
Address (city, state, and ZIP code)		10 Source of Funding Numbers	
Program Element Number	Project No.	Task	Work Unit Accession No.
Title (Include Security Classification) War As Art or Science: A Humanist Vision			
Personal Author(s) Sears, Todd Richard			
1a Type of Report Master's Thesis	13b Time Covered From Jan 1990 To Dec 1991	14 Date of Report (year, month, day) 19 December 1991	15 Page count 107
Supplementary Notation The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the US Government.			
Cosati Codes:	Field	Group	Subgroup
Subject Terms (continue on reverse if necessary and identify by block number) Strategy, War, Clausewitz, Art, Science, Paradigm, Genius			
Abstract (continue on reverse if necessary and identify by block number) This thesis attempts to answer the question, "Is War art or science?" In doing so it draws heavily upon Thomas Kuhn's "humanistic" philosophy of science. If "War" can be separated theoretically into two distinct analytical units, preparation for war, and conduct of war, then the answer to the question becomes more accessible. The war preparation process is notably similar to the Kuhnian dynamic of scientific process, i.e., the evolution of a paradigm through inter-disciplinary criticism and rearticulation. A case study of post-WWII US nuclear strategy is offered to substantiate the claim that war preparation operates in a way that is remarkably similar to Kuhnian science. So, if war preparation is scientific, then the conduct of war, a fundamentally different activity, may be seen as artistic. This case is made by drawing heavily upon the writings of General Carl von Clausewitz, and the 18th century German idealist Immanuel Kant. The end result of the work is to posit the existence of two types of men necessary for the execution of War, those who demonstrate ability in the sublime genius of science, and those who are more suited to develop the heroic genius of battle. The question then arises as to the US military educational system's ability to identify these men and intensify their development within each's specific forte.			
Distribution/Availability of Abstract <input checked="" type="checkbox"/> unclassified/unlimited <input type="checkbox"/> same as report <input type="checkbox"/> DTIC users		21 Abstract Security Classification Unclassified	
2a Name of Responsible Individual Professor R. H. S. Stolfi		22b Telephone (Include Area Code) (408) 646-2981	22c Office Symbol NS/Sk

DD FORM 1473, 84 MAR

83 APR edition may be used until exhausted

Security Classification of this Page

All other editions are obsolete

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War as Art or Science: A Humanist Vision

by

Todd Richard Sears
Lieutenant, United States Navy
B.A., University of South Carolina, 1986

Submitted in partial fulfillment of the requirements
for the degree of

**MASTER OF ARTS IN NATIONAL SECURITY
AFFAIRS**

from the

NAVAL POSTGRADUATE SCHOOL

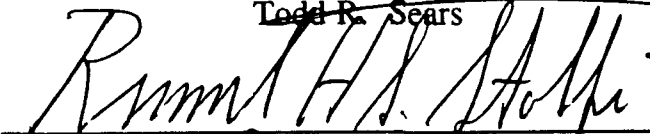
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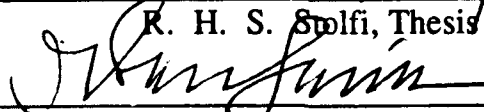


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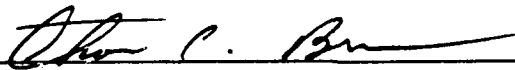
Approved by:



R. H. S. Stolfi, Thesis Advisor



Donald A. Benheim, Second Reader



Thomas C. Bruneau, Chairman, Department of National Security
Affairs

ABSTRACT

This thesis attempts to answer the question, "Is War art or science?" In doing so it draws heavily upon Thomas Kuhn's "humanistic" philosophy of science. If "War" can be separated theoretically into two distinct analytical units, preparation for war, and conduct of war, then the answer to the question becomes more accessible. The war preparation process is notably similar to the Kuhnian dynamic of scientific process, i.e. , the evolution of a paradigm through inter-disciplinary criticism and rearticulation. A case study of post-WWII US nuclear strategy is offered to substantiate the claim that war preparation operates in a way that is remarkably similar to Kuhnian science. So, if war preparation is scientific, then the conduct of war, a fundamentally different activity, may be seen as artistic. This case is made by drawing heavily upon the writings of General Carl von Clausewitz, and the 18th century German idealist Immanuel Kant. The end result of the work is to posit the existence of two types of men necessary for the execution of War, those who demonstrate ability in the sublime genius of science, and those who are more suited to develop the heroic genius of battle. The thesis suggests a reevaluation of U. S. military education as to its ability to identify and enhance the opportunities of these distinctive men within the armed forces.

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ACKNOWLEDGEMENTS

This thesis has been a labour of both love and hate. It has been nerve-wracking, time consuming, and in certain instances I fear, self-consuming. But thanks to the tireless love and support of my wife, Hala, I am now at a stage where I have a finished work of quasi-profundity.

Rather than choose a thesis subject which is empirically resesarchable and policy oriented, I chose a topic which was a playground for intuition and fundamental speculation. The utility of such an endeavour as this for the armed forces at large will always be a question mark for me. But, as long as this thesis inspires more questions, I suppose it is serving a useful purpose. So I thank the Naval Postgraduate School for allowing me to embark upon this rather unique and somewhat esoteric pursuit.

My thesis advisors, Professor R. H. S. Stolfi and Professor Donald Abenheim were instrumental in introducing new angles of inquiry to my creative process while at the same time keeping the fruits of my ebulliance "tethered to the earth." I salute them.

The sections on Thomas Kuhn and his philosophy of science were greatly facilitated by several pints of ale and my frequent contact with Professor Davis Baird of the University of South Carolina Deparment of Philosophy (a heady combination I assure you). I thank him.

For Professor Enrique Alvarez, a resounding and roaringly boisterous, "Hooray!"

And I'd like to thank Professor Frank Teti for implicitly pointing out the error of his ways. Hegel lives! (or perhaps its only his *Geist*?)

And thanks to my parents, Richard and Anita Sears, for their support which was launched boldly from 3000 miles away.

Creative energy must come from some source. Though the words before you are my own, the spirit and dynamism which drove their manipulation comes from a stronger inspiration.

So I dedicate this thesis to my brother, my muse,
Jonathan Holbrooke Sears (1968-1987).

I. INTRODUCTION

American strategists and warfighters are in the critical, perhaps terminal, stages of a nameless institutional disease characterized by intellectual sloth and functional entropy. Technology is revered as a demigod, scion of Physics and Man. Bureaucracy and administrative efficiency have supplanted passion and purpose as normative standard-bearers. No longer is the exploration of first principles considered important, let alone even considered. The situation is unfortunate, perhaps fatal. A group meets its demise when the ideas of that group become stagnant, although such a condition is often internally perceived and rationalized, as progressive. To reflect upon first principles is to purge the group and its product of superfluous doctrine, procedure and method, and to introduce new angles of approach to a given end. Such analysis will not inevitably lead to change, but will suggest possible existing flaws and option for solutions in the future. The result is not to further confuse, but to clarify, with the intent that clarification will lead to intensified focus.

Philosophy is the oldest and most sublime of all disciplines. Its messages transcend all academic endeavours, from the heady metaphysical lessons of quantum mechanics, to the Hobbesian question of man's disposition in a "state of nature." To bring the tools of philosophy to the study of strategy and warfighting is nothing new. In fact, philosophy and war have a quite ancient

tradition of intimacy, ranging from Plato, who asked if War is indeed an art¹, Aristotle, tutor of Alexander the Great, through the Stoic proclamations of Marcus Aurelius Antoninus, to the 19th century speculation of the Prussian, Carl von Clausewitz, a man deeply inspired, if not convinced, by the great German idealist metaphysical movement of his day. Protagoras and Kant similarly are key thinkers in understanding the fundamental issues of war, as will be demonstrated forthwith.

While philosophical discourse is vigorous and robust in the modern American academy, it has all but died in the armed services. Many professors instructing the US officer corps introduce the basic principles. But only in rare circumstances are these lessons taken to nest by the students and developed individually, used as a starting block for further reflection upon life and the officer's chosen profession of arms. This is not a result of any inability of the students to grasp the abstract ontological issues of pure thought. It is a result of the given condition in America that fundamental inquiry is considered unimportant. This rather shallow sociological orientation is a product of a dogmatic, bureaucratically imposed value system placed upon the students by the military, and by society as a whole, a value system embracing digital vice analog thinking, a system determined largely by a dangerous synthesis of the 17th century European Enlightenment and 20th century American Pragmatism.²

1 Plato, *Republic*, ed. and trans. B. Jowett, (New York, NY: Vintage Books), 67.

2 Though it is beyond the scope of this paper, I believe a case could be made that the reason for a lack of a mandate for speculation in U. S. society as a whole is predominantly due to the Pragmatist movement of the early 20th century, as led by J. Dewey, W. James and C. S. Peirce. It is my belief that Pragmatism in America spelled the death of metaphysics and intellectual depth on a grand social scale. Pragmatism was

Carl von Clausewitz is without doubt the foremost thinker on War as a valid ontological subject. The Prussian died in 1831 and has left a legacy of profundity to his students in years since. Upon proper analysis, the reader of *On War* will be drawn to the centrality of man's role in war, from the exertion felt by the infantry soldier on the march to the genius of the commander in translating the chaos and uncertainty inherent in war into action and ultimately, victory. This notion of Man's predominance in the act of conflict is today wrongly seen as anachronistic.

The focus of conflict in the present is myopic, upon Patriot missiles, Stealth fighters, and space-based rail guns. Technology, science, and operational analysis seem to reflect the essence of the modern military. Yet the question remains, "Is war a science, dominated by contemplation, method, and technological offspring? Or is it an art, an endeavour placing prime emphasis on innovative and creative action?" These questions have not been sufficiently answered by the defense-intellectual community, or the academy at large. Is war an art or science? To attempt an answer to this question is an exercise in first principles, a quest for essence.

Whether the question is important enough to merit a response can be found upon review of the basic definitions used by today's military decision

embraced by America and interpreted to mean that it could stop philosophizing. However, it is also my opinion that this condition does not need to be so. As will be shown, Immanuel Kant's metaphysics, a foreshadowing of American Pragmatism 120 years early, is central to my argument.

makers. One need only look at a few of these explications of "strategy," used to illuminate the concept of "war", to see that the issue is muddy beyond reason.³

For example, definitions of strategy include the following:

Lexicon of Military Terms- A science, an art, or a plan (subject to revision) governing the raising, arming, and utilization of the military forces of a nation (or coalition) to the end that its interests will be efficiently promoted or secured against enemies, actual, potential, or merely presumed.

Dictionary of United States Military Terms for Joint Usage- The art and science of developing and using political, economic, psychological and military forces as necessary during peace and war, to afford the maximum support to policies in order to increase the probabilities and favorable consequences of victory and to lessen the chances of defeat.

Webster's Third New International Dictionary- The science and art of employing the political, economic, psychological and military forces of a nation or group of nations to afford the maximum support to adopted policies in peace or war.

Soviet Military Strategy (V. D. Sokolovsky)- Military strategy is a system of scientific knowledge dealing with the laws of war as an armed conflict in the name of definite class interests. Strategy— on the basis of military experience, military and political conditions, economic and moral potential of the country,

³ All definitions taken from Edward N. Luttwak, *Strategy: The Logic of War and Peace*, (Cambridge MA: The Belknap Press of Harvard University Press, 1987), 240-241.

new means of combat, and the views and potential of the probable enemy—studies the conditions and the nature of future war, the methods for its preparation and conduct, the services of the armed forces and the foundations for the material and technical support and leadership of the war and the armed forces. At the same time, this is the area of the practical activity of the higher military and political leadership, of the supreme command, and of the higher headquarters, that pertains to the art of preparing a country and the armed forces for war and conducting the war.

Introduction à la stratégie (A. Beaufre)- the art of the dialectics of wills that use force to resolve their conflict.

In the examples above "science" and "art" are used cavalierly and seemingly, interchangeably. It is tragically unclear whether war (as seen through the lens of "strategy" defined) is an art or science, an art and science, or some strange, special, and as yet undefined, hybrid of the two. It seems a natural response on the part of the conscientious strategic thinker to attempt to clarify these terms so as to better, more lucidly address his subject.

Methodologically, the approach will be as simple as the rules of formal logic allow. One of the most commonly used syllogisms in basic argument is called *modus tollendo ponens*, or, the disjunctive syllogism⁴, expressed symbolically as $p \vee q, \neg q, \therefore p$, and verbally as "it is the case that either p or q, not q, therefore p. This syllogism, though simple, is extremely powerful. It should be intuitively obvious however, that few arguments fall cleanly into

4 Robert Paul Churchill, *Becoming Logical: An Introduction to Logic*, (New York, NY: Saint Martin's Press, 1986), 239.

this very specific logical form. Regardless, in the attempt to formulate an argument in this way, the thinker is forced to deal with the definitional uncertainties and ambiguities of the propositions in doing so.

Fitting the subject matter of this paper into the disjunctive syllogism results in two possible outcomes:

1. War is either art or science. War is not art. Therefore, war is science.
2. War is either art or science. War is not science. Therefore, war is art.

Another alternative exists in rejecting the syllogism outright. Some would argue that it is not possible to fit the question into a *modus tollendo ponens* form at all because the terms used in the initial premise to classify "war," "art," and "science," are not mutually exclusive and as such cannot be set up as a disjunctive statement, that there is some sort of cognitive overlap in the terms, thus forcing the statement, "War is both art and science."

"War is art and science." Intuitively this statement seems more meaningful than either of the two initial disjunctive premises noted above. It is ludicrous to suggest that war contains no elements of either art or science, while it is reasonable to suggest that war is a subtle synthesis of the two. Yet the question still remains as to the specific ways in which war resembles art and science. The purpose of this paper then is to draw the lines of demarcation and intersection between art and science and then determine how and in what ways they are applicable to the study of war. It will analyze the "subtle synthesis" described above in hope that it will help guide future planners and military thinkers.

The reader should have no doubt as to where this paper is leading him. This is certainly not a polemic; rather, it is a serious and personal response to

a perceived eclipse of Man's role in warfare, and on a larger scale, in life. This paper will not celebrate the revolutionary "state of the art" technologies used in modern war fighting, nor will it derogate them. It intends only to place them, and technology as a generic theoretical entity, in the proper perspective to Man. It will sketch separately science and art in war, and then explore the necessary coupling of the two in necessary terms of horse and cart. In doing this it will draw heavily upon the disciplines of philosophy of science, philosophy of art, and several works by strategic classicists led primarily by Carl von Clausewitz.

II. MODERN SCIENCE: THE TRIUMPH OF PROCESS OVER PRODUCT

A. INTRODUCTION

Without question, the single most important contribution to Philosophy of Science in the past 30 years is Thomas Kuhn's *The Structure of Scientific Revolutions*, originally published in 1962 as part of the *Encyclopaedia of Unified Science*. In this work, Kuhn describes the institution of science in a manner which boldly and refreshingly evades the questionably necessary positivist explications of the past, and in doing so he instigated a very lively debate throughout the philosophic community. In *Structure*, Kuhn discards the study of science as the comprehensive accumulation of discoveries and subsequent aggregation of these discretions under the rubric "Science" or "Truth." Instead he places science in a socio-historical context stressing process dynamics vice production in the form of a scientific corpus with some determinable epistemological status or even technology. This distinction is important for many reasons; and once science is accepted as process, not product, the equation of "Science" with "Technology" glows in all of its fallacious splendor.

Aside from distinguishing between science and technology however, the primary reason behind exploring Kuhn's notion of science is to demonstrate the place of science in the martial equation. For, without doubt,

as alluded to in the introduction, science somehow plays a critical role in war, the question is, "How?"

B. THEORETICAL CONSTRUCTION

To answer this question properly, the idea of the "martial equation" must be examined further. By martial is meant "of war."⁵ To speak of the martial equation then, is ultimately to define war. As it is this paper's concern to explore the fundamental elements of war, it is sensible to use the definition of war as expounded by Clausewitz, perhaps the West's most fundamental thinker on the nature of war. For Clausewitz war is "an act of force to compel our enemy to do our will."⁶ From this definition it is obvious that war is the "act" or the "doing" of force against the enemy. Unfortunately, given a symptomatic American tendency to consolidate entities, be they definitions or corporations, in the name of efficacy and at the expense of specificity and quality, War has come to be defined in terms of an overly broad range of subjects and disciplines. If this analysis is to continue smoothly, the the

5 *Oxford American Dictionary*, (1980), s. v. "martial."

6 Carl von Clausewitz, *On War*, trans. and ed. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 75. This definition is a bit risky to use because it becomes subject to the frequently asked questions as to how war, as defined, is different from an anti-terrorist campaign as is taking place in Northern Ireland, or a police raid upon an urban drug den. Given Clausewitz' definition, all of the above would necessarily be classified as war. I have no problem with this assertion. As ultimately the paper will look at the centrality of Man in conflict, it makes little difference from a theoretical view where the violence is taking place. In fact, as Clausewitz mentions, the principles of war can be illustrated by looking at the theoretical will and conduct of duelists or wrestlers. To get into a formalized taxonomy of conflict is unnecessary within the bounds of this paper, though useful, indeed imperative, for others.

overly comprehensive conception of War, as used by contemporary military thinkers, must be explicated further.

There are many facets of discourse within the so-called martial endeavour. These angles of inquiry pertain to the subjects of training, logistics, strategic planning, tactical doctrine, historical case studies, war gaming, weapons evaluation, etc. They are all fundamental to the analysis of war on an all encompassing macro-level, but the utility of thinking of war as a meaningful conceptual entity in terms of these discipline is limited. War is conflict, and it is the conduct of this special belligerent dialectic which should be addressed when discussing war.

If war is the "conduct" of conflict, how then are the subjects discussed above installed within an analytic framework on War? After all, they are clearly important. They are important because they represent the potential leading up to the actual conduct. The martial endeavour then, War, can be broken down and isolated into two areas. 1. Preparation for war, and 2. Conduct of war.

This distinction will be shown as central in addressing the question of art and science in war. In fact, it is submitted that the dynamic of the scientific process is infinitely more congruent with the preparation for war, as opposed to the conduct of war. Before making the connection between war preparation, an admittedly broad and potentially ambiguous category, and science, it is first necessary to explicate the idea of science in a comprehensive manner. As alluded to previously, the thought of Thomas Kuhn will be the foundation of this analysis. In order to present him effectively it is necessary to first review the state of the philosophy of science

against which he necessarily rebelled, for it is Kuhn's rebellion which speaks so well to the conditions of the day. Military thinkers would do well to understand Kuhn, and his view of science.

C. THE INTELLECTUAL GENESIS OF KUHNIAN SCIENCE

Philosophy of science as a formal discipline is a fairly recent development. Though implicit notions of science and its role in epistemological inquiry could be derived from most all philosophers, science was treated as a unique subject of exploration by philosophers beginning with John Stuart Mill (1806-1873) and William Whewell (1794-1866). These two men were fundamentally in opposition as Mill attempted to argue that the central problem in philosophy of science was to attribute some kind of meaning to independent facts of observation, and experimental process. For Whewell, a pseudo-Kantian, primacy was placed upon theory and the thinker and their roles as the drivers of scientific inquiry.⁷

Mill is considered an inductivist. He believed in the prior status of facts and observation to theory. Not only did facts precede theory, all theory was developed inductively from fact. Scientists, for Mill, argued from the particular to the universal. They would observe a phenomena, and develop a theory to accommodate it. Inductivists are thus, reductionists. All theory is ultimately reduced to experience. This reductionist epistemology should be familiar, as it was articulated in a less specific, though very bold, manner by

⁷ *The Encyclopedia of Philosophy*, s. v. "Philosophy of Science, History of," By R. Harré.

David Hume (1711-1776) in *An Inquiry Concerning Human Understanding*. Ultimately, the reductionist approach to knowledge and science would give rise to one of the most important philosophical movements in the 20th century, logical positivism.

Ian Hacking outlines the primary tenets of the positivist stance lucidly as he says,

The key ideas are as follows: (1) An emphasis upon verification (or some variant such as *falsification*): Significant propositions are those whose truth or falsehood can be settled in some way. (2) *Pro-observation*: What we can see, feel, touch, and the like, provides the best content or foundation for all the rest of our non-mathematical knowledge. (3) *Anti-cause*: There is no causality in nature, over and above the constancy with which events of one kind are followed by events of another kind. (4) *Downplaying explanations*: Explanations may help organize phenomena, but do not provide any deeper answer to *Why* questions except to say that the phenomena regularly occur in such and such a way. (5) *Anti-theoretical entities*: Positivists tend to be non-realists, not only because they restrict reality to the observable but also because they are against causes and are dubious about explanations. They won't infer the existence of electrons from their causal effects because they reject causes, holding that there are only constant regularities between phenomena. (6) Positivists sum up items (1) to (5) by being *against metaphysics*. Untestable propositions, unobservable entities, causes, deep explanation-these, says the positivist are the stuff of metaphysics and must be put behind us.⁸

The logical positivist movement was developed and championed by a philosophical discussion group which met periodically and called itself the Vienna Circle. It was led by Moritz Schlick, and its members included Rudolph Carnap, Herbert Feigl, and Kurt Gödel among others. One of the most important products of the logical positivist movement for philosophy of

⁸ Ian Hacking, *Representing and Intervening: Introductory Topics in the Philosophy of Natural Science*, (New York, NY: Cambridge University Press, 1983), 41-42.

science specifically, and epistemology in general, was what would come to be known as the Received View On Theories.⁹

From 1910-1913, Bertrand Russell and Alfred North Whitehead were publishing their titanic *Principia Mathematica* in 3 volumes. *Principia* made a convincing case demonstrating that all mathematics could be done in terms of logic, indeed that logic reflects the essence of mathematics. Mathematical statements of scientific laws, and definitions of theoretical terms could be given in terms of mathematical logic.¹⁰ This elegant proof, as articulated by Russell and Whitehead and absorbed by the Vienna Circle, was combined with the classic positivist tenets as outlined above to give birth to the received view. The basic articulation, which seems fairly rigorous at first glance, is sketched below. For the positivists, observation is tied to theory, and this act of bonding, and its logical consequences define science.

The Received View construed scientific theories as axiomatic theories formulated in a mathematical logic L meeting the following conditions:

- (i) The theory is formulated in a first-order mathematical logic with equality, L .
- (ii) The non-logical terms or constants of L are divided into three disjoint classes called vocabularies:

9 The term, Received View, was introduced in Hilary Putnam's "What Theories Are Not" in *Logic, Methodology, and Philosophy of Science: Proceedings of the 1960 International Congress*, edited by Ernest Nagel, Patrick Suppes and Alfred Tarski, (Stanford, CA: Stanford University Press, 1962), 240-251.

10 Frederick Suppe, *The Structure of Scientific Theories*, 2nd ed., Frederick Suppe ed. , (Chicago, IL: University of Illinois Press, 1977), 12.

(a) The logical vocabulary consisting of logical constants (including mathematical terms).

(b) The observation vocabulary, V_O , containing observation terms.

(c) The theoretical vocabulary, V_T , containing theoretical terms.

(iii) The terms V_O are interpreted as referring to directly observable physical objects or directly observable attributes of physical objects.

(iv) There is a set of theoretical postulates T whose only nonlogical terms are from V_T .

(v) The terms in V_T are given an explicit definition in terms of V_O by correspondence rules C -that is, for every term ' F ' in V_T , there must be given a definition for it of the following form: $(x)(Fx \text{ } \forall \text{ } Ox)$ [where \forall = "if and only if"], where ' Ox ' is an expression of L containing symbols only from V_O and possibly the logical vocabulary.¹¹

For the purposes of this paper it is not necessary to grasp the entirety of the received view's meaning as applied to the rigors of formal logic.¹² It is important however, to take from this discussion two broader points. First, the radical reductionism derived from Mill is evident. The rules above describe a system whereby the only allowable symbolization, apart from the analytic

11 Ibid. , 16.

12 It should be noted here that the received view as developed by the logical positivists and articulated by Putnam is no longer considered a tenable epistemological position. For reasons involving exceedingly rigorous issues of formal mathematic logic, which I judge to be beyond the scope of this paper, the received view's position has been weakened to the point of relative dismissal in the literature. The quasi-divine philosophical status of its progenitors, the Vienna Circle, Russell and Whitehead however has not changed in the least, indeed, logical positivism is still a legitimate school. Only its applications to scientific theory have been defeated. It is because of this attack on the received view that other thinkers had the opportunity to explore more various angles of philosophic inquiry.

mathematical and logical meta-symbols is derived from some kind of observable phenomena. This can be seen in section (iii) of the received view above. All possible scientific knowledge is drawn from the immediately observable, V_O . All theory, V_T , is accumulated directly from these V_O . Second, the received view and its proponents are concerned with theory. They see theory as a product of science and the central focus of scientific inquiry.

Though Sir Karl Popper and Rudolph Carnap disagree as to the proper activities to conduct upon a theory once formulated, Popper promotes a falsificationist criteria while Carnap heralds a verificationist criteria,¹³ they both agree that the theory, the product of science, is of primary importance. Note that the positivist conception of theory is such that the role of the observer is all but ignored. The positivists see the act of observation as a kind of neutral exercise, unsullied by any mental "processing" by the mind. What is seen and symbolized in the positivist's first order calculus is all that can be called "real." All theoretical terms are cognitively significant in the sense that they each satisfy the verification (or falsification, for Popper) criteria of meaningfulness. This is to say that something is considered meaningful if and only if it can be verified through observation. Ergo, all other notions, love, heroism, God, passion etc, are not observable in any positivist sense and are thus meaningless.

As the Received view became increasingly weakened by repeated and rigorous attacks on its logical foundations, room opened up for other, radically different conceptions of science. Out of the entropic state of affairs, rose

13 Hacking, *Representing*, 5.

Thomas Kuhn. Kuhn is the leader of what can be termed the *Weltanschauung* (world-view) theorists.¹⁴ He, along with Toulmin, Bohm, and Hanson, best represent this school. It seems an appropriate label as all members of this school reject the pure focus on theory and instead believe that the broadly reaching world-view of the scientific community is an essential point of study.

Hans Reichenbach, in 1938, introduced to philosophy of science the notions of "context of discovery" and "context of justification" to make the distinction between the way a scientific or mathematical result is discovered and the manner in which it is justified.¹⁵ It is within the bounds of this distinction that the *Weltanschauung* philosophers of science can best be addressed.

The context of discovery, for Reichenbach, is the field of concern for, historians, psychologists and sociologists. It answers questions such as, Who made the discovery? When? Was it a lucky guess, an idea filched from a rival, or the pay-off for 20 years of ceaseless toil? Who paid for the research? What religious or social milieu helped or hindered this development?¹⁶

The context of justification however, is the realm of philosophy, epistemology and philosophy of science specifically. Knowledge as traditionally defined in

14 Suppe, *Structure of Scientific Theories*, 125.

15 Hans Reichenbach, *Experience and Prediction*, (Chicago, IL: University of Chicago Press, 1938), 6-7.

16 Hacking, *Representing*, 6.

philosophy is "justified true belief,"¹⁷ and the question of how, within a coherent logical framework, a theory is justified, is the stuff of Knowledge.

Now consider the finished end-product: an hypothesis, theory, or belief. Is it reasonable, supported by the evidence, confirmed by experiment, corroborated by stringent testing?¹⁸

Philosophers were concerned with the finished product of theory, not the events and interactions which ultimately produced it. They would grant maximum importance upon the logical coherence of a theory in its completed stages, but not to the dynamics leading up to that completed form, i. e. , the modifications that inevitably occur to a theory as it is subject to various types of experimental tests.

The *Weltanschauung* philosophers of science rebel against this view. For them, the process of science is science.

Full epistemic understanding of scientific theories could only be had by seeing the dynamics of theory development, the acceptance and rejection of theories, the choosing of which experiments to perform and so on. To understand a theory was to understand its use and development.¹⁹

In the tradition of Kant, the *Weltanschauung* adherents believe in, if not the subjectivity of truth, at least the subjectivity inherent in man's quest to substantiate it.

17 Recollections of lectures by Professor Foster Tait, University of South Carolina Department of Philosophy, 1982-1986.

18 Hacking, *Representing*, 6.

19 Suppe, *Structure of Scientific Theories*, 126. Suppe holds that this view was convincingly presented by Wittgenstein in *Philosophical Investigations*, (Oxford, England: Blackwell, 1953). This is a bit odd as Wittgenstein is usually perceived as one of the most revolutionary thinkers on logical positivism as well.

This approach does not claim there is a unique set of categories determining the *Weltanschauung*, but rather allows that significantly different ones are possible; it is committed, however, to there being certain distinctive features or characteristics of scientific *Weltanschauung*.²⁰

The following section on Thomas Kuhn specifically will attempt to elucidate these "distinctive features." It is the Kuhnian scientific dynamic which will be used in a case study to substantiate the claim that the scientific part of war is that of preparation prior to battle.

D. KUHNIAN SCIENCE

Thomas Kuhn began his career as a physicist and then changed paths and took on history and philosophy of science as his intellectual focus. As the positivists and the pseudo-positivists struggled to find the proper mode of justification so as to assert "truth," Kuhn, in the heat of a Kantian moment²¹, saw that truth was far too elusive. He realized that the elusiveness of truth does not mean something useful cannot be said of science, but only that the pseudo-positivist aim is likely off. To contrast Kuhn with his predecessors more concretely, Hacking makes the following assertions.

20 Ibid. , 127.

21 Kant in his various manifestations is a dissertation subject in himself. The sense in which I bring him into the discussion is basic. Simply, he showed, in his *Critique of Pure Reason*, that a "thing in itself", or *noumena*, cannot be known. Knowledge is a function of the intellect. The intellect transforms the *noumena* into *phenomena*, or, "thing as known." The intellect performs an operation on *noumena* whereby it places it through 1. time and space, and 2. the categories (Quantity, Quality, Relation, Modality). The result is *phenomena*, which we, as humans, take as reality. Truth, *noumena*, can never be known. Kuhn realizes the necessity of man's role in the quest for truth, and thus it is that I use the phrase "Kantian moment."

Kuhn holds:

- There is no sharp distinction between observation and theory.
- Science is not cumulative.
- A live science does not have a tight deductive structure.
- Living scientific concepts are not particularly precise.
- Methodological unity of science is false: there are lots of disconnected tools used for various kinds of inquiry.
- The sciences themselves are disunified. They are composed of a large number of only loosely overlapping little disciplines many of which in the course of time cannot even comprehend each other...
- The context of justification cannot be separated from the context of discovery.
- Science is in time, and is essentially historical.²²

Central to Kuhn's conception of science is his notion of paradigm. In *Structures*, he claims that the word, "paradigm," "figures more often than any other, excepting the grammatical particles..."²³ This is truly the case. In fact, "paradigm" was used so much that one Cambridge philosopher of language, Margaret Masterman, felt a need to check the word's coherence of meaning throughout the book. She found 21 different meanings for the word. They are presented here, in a condensed form so to give the reader an idea of the term's

²² Hacking, *Representing*, 6.

²³ Thomas Kuhn, *The Essential Tension: Selected Studies in Scientific Tradition and Change*, (Chicago, IL: The University of Chicago Press, 1977), 293-94.

meaning(s) and also to make Kuhn's subsequent response, in which he clarifies the concept of paradigm, more cogent. Masterman submits,

Thus he describes a paradigm:

1. ...a universally recognized scientific achievement...
2. ...a myth...
3. ...a 'philosophy,' or constellation of questions...
4. ...a textbook or classic work...
5. ...a whole tradition, and in some sense, a model...
6. ...a scientific achievement...
7. ...an analogy...
8. ...a successful metaphysical speculation...
9. ...an accepted device in common law...
10. ...a source of tools...
11. ...a standard illustration...
12. ...a device, or type of instrumentation...
13. ...an anomalous pack of cards...
14. ...a machine tool factory...
15. ...a gestalt figure which can be seen two ways...
16. ...a set of political institutions...
17. ...a 'standard' applied to quasi-metaphysics...
18. ...an organizing principle which can govern perception itself...
19. ...a general epistemological viewpoint...
20. ...a new way of seeing things...
21. ...something which defines a broad sweep of reality...²⁴

Kuhn's uses of the word, "paradigm" are far too broad in scope. But in response to Masterman he states, "Though neither the compiler of that index nor I think the situation so desperate as those divergences suggest, clarification is obviously called for."²⁵

On the surface, a paradigm is a worldview, a *Weltanschauung*, a bounded intellectual environment as well as the conceptual and physical tools which define it. Even this quasi-definition is not satisfactory however for the

24 Margaret Masterman, *Criticism and the Growth of Knowledge*, eds. Imre Lakatos and Alan Musgrave, (New York, NY: Cambridge University Press, 1970), 63-65.

25 Kuhn, *Tension*, 294.

purposes of analyzing a specific case and testing its legitimacy as scientific (as will be done in Chapter III). Before going further into an operational explication of "paradigm," it is useful to look at the nominal Kuhnian scientific process as described by Hacking. He calls it Kuhn's "tidy structure of revolution:" 1. *Normal science* —> 2. *Crisis* —> 3. *Revolution* —> 4. *New normal science*.²⁶

Normal science is a routine process conducted within a fairly well-defined intellectual and material atmosphere. This atmosphere, or environment, is what Kuhn characterizes as a paradigm. Occasionally, during the standard conduct of normal science, major problems arise which cannot be explained within the environment as it exists. A problem may arise that flies directly into the face of a theory which has to that point been accepted as valid and true. Or some new phenomenon may appear in the environment that, while not refuting any theory directly, is so new and so dramatic, that existing theory is too limited to accept it.

When such a novelty arises, and it cannot be fit into the existing state of the discipline, it is known as a *crisis*. When the discipline, be it physics, biology, nuclear strategic planning or, paleo-botanical morphology finds itself in a state of crisis, members of the community will do one of two things. They will 1. develop a new paradigm while they struggle to reconcile the new facts with new theory, or 2. stubbornly resist change and attempt to reinterpret or remeasure, or requalify, in the case of social science in general, the new facts so that they will become congruent within the bounds

²⁶ Hacking, *Representing*, 7.

of the existing paradigm. Option (1) describes a *revolution*, and once this revolution is accepted by the scientific community as a whole, that community begins a *new normal science*.

So, as shown in this brief review of the scientific process according to Kuhn, paradigm is a core concept. It defines normal science, breeds anomaly and crisis, causes revolution, and ultimately is redefined to start the process over. How then can the term be further explicated? Kuhn sees the word as having two distinct definitions. He sees paradigm₁ as a "disciplinary matrix," and paradigm₂ as "exemplar." Both meanings are explored below.

It is useful to study Kuhn's response to Masterman's criticism. In his essay "Second Thoughts On Paradigms," Kuhn states,

In the book the term "paradigm" enters in close proximity, both physical and logical, to the phrase "scientific community." A paradigm is what the members of a scientific community, and they alone, share. Conversely, it is their possession of a common paradigm that constitutes a scientific community of a group of otherwise disparate men.²⁷

Once again, it is important to reiterate two salient points. First, no conception of truth has entered into the discussion. No truth value judgements are being made in reference to the paradigm, or the theories contained therein. Second, Kuhn's focus, antithetical to the positivists, is upon the role of the social institution, the scientific community, in determining the rules of conduct within the paradigm, not determining truth, but determining the rules which guide the quest thereto.

²⁷ Kuhn, *Tension*, 294.

So, an analysis of the scientific community discloses a well trodden path into the abstract notion of the paradigm. Kuhn offers at least two passages which allow a firmer grasp on the relation of the paradigm to scientific communities and more specifically, to the disciplinary matrix. Initially in, *Structures*, he recognizes the connection,

In the sciences,...the formation of specialized journals, the foundation of specialists societies, and the claim for a special place in the curriculum have usually been associated with a group's first reception of a single paradigm.²⁸

In another response to Masterman, he gives the best definition to date,

A scientific community consists, in this view, of the practitioners of a scientific specialty. Bound together by common elements in their education and apprenticeship, they see themselves and are seen by others as the men responsible for the pursuit of a set of shared goals, including the training of their successors. Such communities are characterized by the relative fullness of communication within the group and by the relative unanimity of the group's judgement in professional matters. To a remarkable extent the members of a given community will have absorbed the same literature and drawn similar lessons from it.²⁹

This description of the scientific community allows a clean entrance into the idea of paradigm 1, or the disciplinary matrix. Kuhn selected this term because "disciplinary" implies the common possession of the practitioners of a professional discipline, and "matrix" because it is composed of elements of various sorts subject to further specification.³⁰

28 Kuhn, *Structures*, 19.

29 Kuhn, *Tension*, 296.

30 Ibid. , 297.

Kuhn identifies three elements of the disciplinary matrix which are central to the cognitive operation of the group: symbolic generalizations, models, and exemplars. Symbolic generalizations represent broad relationships of concepts or groups of concepts, "those expressions deployed by the group, which can readily be cast in some logical form.."31 In physics they are often found in symbolic form. For example, no one knows what matter is, but it has mass and the equation $f=ma$ still has meaning. Another example would be $I=V/R$. Some symbolic generalizations are expressed in words such as "all cells come from cells," or "action equals reaction." Kuhn suggests that the power of a science increases with the number of symbolic generalizations it contains. 32 Models, for Kuhn, are preferred analogies, such as seeing an electric circuit as a steady state hydro-dynamic system for pedagogical and cognitive reasons.

Exemplars, expanded upon below, are paradigm2, and are subsumed under the disciplinary matrix. Suppe describes the relationship between the disciplinary matrix and exemplars so,

...disciplinary matrixes are acquired implicitly through the educational process whereby one comes to be a licensed practitioner of the scientific discipline. This implicit acquisition comes from the study of one portion of the disciplinary matrix which can be explicitly formulated, the exemplars.33

31 Ibid. , 297.

32 Ibid. , 298.

33 Suppe, *Structure*, 139.

Still exemplars need to be defined. The Oxford American Dictionary defines the term as "a worthy model or pattern," or "a typical example."³⁴ Exemplars are parts of the intellectual development of those in the discipline. They are the examples that may be given by professors in the most basic and introductory courses that act as guides for the application of further theory to nature. Suppe states it as follows,

As a student one studies textbooks which include examples exemplifying the ways the science's symbolic generalizations (the so-called laws of theories) apply to phenomena; and in working textbook and laboratory exercises, he encounters still further examples exemplifying the ways the science applies or attaches its symbolic generalizations to nature. Later in his development he encounters still further examples while doing supervised research; and ultimately in his professional career, various journal articles, research reports, and so on, supply him with still further examples specific to his chosen area of specialization.³⁵

Exemplars then, in a sense, define the framework of reality for the scientist. The researcher sees a phenomenon occurring before him, reflects upon it, and attempts to place it within some kind of coherent framework, i. e. , fit it within his disciplinary matrix by applying exemplars learned on the way. That is the essential dynamic of normal science. With paradigm thus defined, it becomes simpler to give a more focused review of normal science than the cursory look given above. Additionally, after having read this section, the reader should be able to go back into Masterman's list of definitions above and make more sense of it as to the scope of Kuhn's meanings.

34 *Oxford American Dictionary*, (1980), s. v. "exemplar."

35 Suppe, *Structure*, 139.

Normal science proceeds within and defined by the disciplinary matrix. As a science begins to work within the matrix it will have at its disposal a small and limited number of exemplars. These exemplars will be limited in scope and precision with regard to their application to the physical world via interaction of symbolic generalizations. One function of the scientists within the community then is to further articulate and specify both symbolic generalizations and their applications. In other words, the exemplars leave open a number of "puzzles" as to how the generalizations apply to phenomena. Exemplars are examined and manipulated so that they can better relate the new and revised generalizations to nature. The process evolves.

The solving of these questions or puzzles from within the framework, confines, and perspective supplied by the disciplinary matrix—which in turn further articulates and extends that matrix—is the central task of normal science.³⁶

Normal science does not have novelty or anomalous discovery as its goal, quite the contrary. Instead it is concerned with articulation, specification, and coherence of the disciplinary matrix as it presently stands. During the course of normal science, certain phenomena may arise which do not square with expectations derived from generalizations, models, and exemplars. These phenomena are recognized however to the extent that what they reflect is beyond the ability of the matrix to cope.

36 Ibid. , 142.

Anomaly appears only against the background provided by the disciplinary matrix. The more precise and far-reaching that disciplinary matrix is, the more sensitive an indicator it provides of anomaly and hence of an occasion for disciplinary matrix change.³⁷

The effort to fit the novel phenomena into the existing matrix by adjusting generalizations and exemplars therein is called *extraordinary research*, and is characterized by the tendency of those conducting it to act and experiment, and look for new data in a way that is much less formalized and structured than in an environment without anomaly. The period in which this occurs is called *crisis*. Extraordinary research resolves the crisis in one of three ways:

(a) the precrisis theories, exemplars and techniques ultimately prove able to handle the crisis-provoking problems despite the despair of those who have seen it as the end of an existing theory or disciplinary matrix; (b) the problem continues to resist even radically new approaches and the problem is set aside for a future generation with more developed tools; (c) a new candidate for disciplinary matrix emerges with an ensuing battle over its acceptance. This third form of resolving crisis constitutes a scientific revolution.³⁸

After the revolution occurs, a new normal science, driven by the routines reflected by the new disciplinary matrix, comes into being. The dynamic repeats over time, and thus can, indeed, must, science be called a process.

A scientific revolution can be called a paradigm shift, or a change in *Weltanschauung*, or worldview. Kuhn himself describes such a change as not unlike a gestalt shift.

37 Ibid. , 143.

38 Ibid. , 146.

...paradigm changes do cause scientists to see the world of their research-engagement differently. In so far as their only recourse to that world is through what they see and do, we may want to say that after a revolution scientists are responding to a different world.³⁹

Such a paradigm shift can only happen however, to the person who is working within the disciplinary matrix. Changes in microbiology will likely not have an effect upon a high energy particle physicist's worldview. Similarly, a physicist who is ideologically opposed to all types of nuclear weapons regardless of employment or posture, will not have his worldview altered in the least by a change in targeting policy.

39 Kuhn, *Structure*, 111.

E. CONCLUSION

A case has been made that the idea of science as "product" is insufficient for a comprehensive analysis of the scientific endeavour. This is not to say however, that the ministrations of the positivists and their ilk are useless. They certainly are not. What those who concentrate on theory do with theory is remarkable, both mathematically and philosophically. "In an essential way, the philosophies of Carnap and Popper are timeless: outside time, outside history."⁴⁰ It is essential to realize that the basic logics of Popperian falsificationism and Carnapian verificationism are just as valid for approaching some sense of truth within the framework of the new thinkers, as they are on their own. But, say Kuhn and the others, they are not to be addressed exclusively.

The *Weltanschauung* thinkers believe that theories alone do not define science. Theories, and the dynamics of their unique geneeses however, do. It is intended that upon reading the preceding discussion on Kuhnian science, the reader will have accepted science as a special and unique process. This done, the next chapter will argue that the process of war preparation, strategic planning for national security in particular, follows a very similar path to that of science. Kuhnian science will be operationalized in a theoretical sense and applied to the nuclear strategic process (1945-1989) as a case study.

⁴⁰ Hacking, *Representing*, 6.

III. SCIENTIFIC STRATEGIZING: THE NUCLEAR COMMUNITY

A. INTRODUCTION

Science is not the "scientific method." The "method" is merely a cog in a much more complex apparatus. Science is a dynamic process which has as its goal, nominally, determination of Truth. Of course, this is a bold endeavour. Ernst Cassirer, the esteemed humanist philosopher, states that, "Knowledge and Truth belong to a transcendental order—to the realm of pure and eternal ideas."⁴¹ But ideational purity and eternality, in all of its metaphysical guises, has been subject to fierce questioning as regards the human intellect's ability to grasp it. Kant, in his *Critique of Pure Reason*, rigorously demonstrated the myriad limitations of the human mind in attempting to come to grips with pure and essential being, or, *noumena*. But still science seeks Truth. If one accepts the premise that absolute Truth can never be uncloaked by the human mind (this is not to say that there is no Absolute, only that it cannot be reached by Man), then it would seem that Science is a futile effort, as its goal could never be attained. Despite this, scientists do what they do, day after day. They think, they write, they pontificate and theorize. Some even teach.

The *Weltanschauung* philosophers do not overtly deny the existence of Truth. They simply do not mention it too frequently. What is most important

⁴¹ Ernst Cassirer, *An Essay On Man*, (New Haven, CT: Yale University Press, 1944), 2.

to this school is that theory, and its application to practical life— (i. e. , experiment, verification processes, or technological development), cohere within the bounds of a paradigm, or, disciplinary matrix. They are not overly concerned with the metaphysical status of theory, or more exactly, how the theory reflects transcendent reality. The paradigm, from its genesis, through its development, and to maturity, is the stuff of modern day science, and it is the concept of science as defined by the paradigm's temporal progression which will guide this chapter. Science is an evolution of ideas which follows a unique and interesting pattern.

The intent of this chapter is to suggest strongly, if not demonstrate beyond a doubt, that the evolution of US strategic nuclear policy is remarkably similar to the generic scientific process as described by the *Weltanschauung* philosophers of science, most notably Kuhn. Perhaps it would be more accurate to say that upon reading this paper, similarities between the evolution of US nuclear strategic policy (from 1945-1989)⁴² and that of science will become apparent. The paper is not meant to equate strategy with science, only to suggest a basic congruence of the two. In doing so it should cause the reader to question his own intuitive notions of what science is, and then perhaps, to come to re-examine War fundamentally, using a fresh view of science.

In order to make the argument suggested above, the paper will establish an analytic framework based upon the Kuhnian model so that the strategic

42 It is, perhaps, more accurate to say that though the paper addresses nuclear evolution in general, due to space limitations, the case study of the normal scientific dynamic will involve the Kennedy-Johnson-Nixon-Ford-Carter sequence of policy initiatives from SIOP-62 through the Countervailing strategy (1961-1981).

process and its evolution can be more comprehensively understood therein. From there, it will look at key roadmarks along the strategic-historical evolutionary continuum, and then attempt to tie them into this framework. If War is to be looked upon as an endeavour that is best analyzed as a dichotomy, i. e. as preparation for war and conduct of war, then this analysis should provoke, if not convince, the reader to explore the problem more thoroughly, and perhaps to conclude that if one is to talk about science and war, then one should look at science in this Kuhnian sense, that it coheres well with war preparation generally, and strategizing specifically.

Thomas Kuhn and all of the *Weltanschauung* philosophers of science concentrated their efforts upon the natural sciences (physics, chemistry, etc.), and all but ignored the social sciences. But if the language and theoretical framework of Kuhnian philosophy can be applied to an analysis of nuclear strategizing in a convincing manner, then it is sensible to suggest that the conduct of developing nuclear strategy may be fundamentally scientific if viewed from afar and occurring in history. The argument then is to show not that strategy is a science, but that strategizing is scientific.

B. COMMUNITY

Robert Holt and John Richardson, Jr. take a hard look at Kuhnian science and analyze its utility for political science in their chapter, "Competing Paradigms in Comparative Politics," in Holt and Turner's *The Methodology of Comparative Research*. They set up a framework which is very useful in determining where a particular discipline stands in its formulation of a paradigm. What they do not address specifically however is that a group exists

that desires to explore a particular subject, that a scientific community is working the problem. So, it seems necessary that if one is to argue that the nuclear strategic process is progressing scientifically, then a 'community' of those initiating the progression must be demonstrated. Science does not occur in a void. It requires the active and deliberate mind to initiate the movement.

Kuhn offers no real operational definition of a scientific community. He states only that it operates within a paradigm, (or is in the process of developing one from initial observational, conceptual, and theoretical chaos), the members read and are published in the same journals, they attend the same meetings and professional fora etc. Intuitively then, it appears that a nuclear strategic community does exist. This intuition is buttressed even further if it is conceded that to be a scientific community, the group of thinkers does not necessarily need to be in consensus regarding the minutia of its inquiry, only in the nature and direction of it.

There are a great many people functioning within the nuclear strategic infrastructure. Some are intimately involved with the development of theory and policy, and some are superficially involved. Not all input to the policy making process is found within the mechanisms of government. Think-tanks, such as the RAND Corporation, the Brookings Institute, the American Enterprise Institute and many others are highly involved. Additionally, members of the American academy, some of whom also work for think tanks, or the government directly, are significantly involved. The military, as well, has its branches which are responsible for various aspects of the policy making process. Roy Liklider identifies three groups operating within the strategic community:

We may for the sake of convenience, divide it into three different groups: the professional military, civilians employed by the government (public civilian strategists), and civilians outside of government (private nuclear strategists).⁴³

The purpose here is not to break down and classify all actors in the system, only to submit that there are many players, and each has varying degrees of strength in its input.

...the strategic community has been considerably enlarged beyond the professional military, and after twenty years there is no indication that the change is a transient one. It is difficult to contend that either the military or civilians have been dominant in strategic decisions; it varies with the individual decision, and in any case the lines of debate within the strategic community tend to cut across rather than to reinforce the military-civilian division.⁴⁴

There is a good deal of symbiosis among all actors.⁴⁵ All are interested in one subject, nuclear strategy. It is this singularity of professional focus that gives the first clue to an observer that a community exists.

The RAND Corporation is a solid example of a microcosm of this strategic community. It is an organization with an aggressive professional direction. General Curtis LeMay, while Deputy Chief of Staff for Research and Development in 1948 stated,

43 Roy E. Licklider, *The Private Nuclear Strategists*, (Columbus, Ohio: The Ohio State University Press, 1971), 7. A more contemporary analysis may be found in Morton Kaplan's *The Wizards of Armageddon*, (New York, NY: Simon and Schuster, 1983).

44 Gene Lyons, cited in Licklider, *The Private Nuclear Strategists*, 7.

45 In fact, the different actors in the process use the academy vigorously. Here at the NPS, for example, certain professors focus their students' seminar papers upon subjects that have been deemed to be of value by a particular strategic "shop" in the Pentagon.

Project RAND is a continuing program of scientific study and research on the broad subject of air warfare with the object of recommending to the Air Force preferred methods, techniques, and instrumentalities for this purpose.⁴⁶

The unity of vision demonstrated by the RANDites was remarkable; and the intellectual ferment existing at this institution made for a heady atmosphere as well. James Digby grasps this feeling as he writes about Thomas Schelling,

...Schelling was only at RAND for a year, on sabbatical from Harvard, but chapters of his 1960 book, *The Strategy of Conflict*, were greatly influenced by the discussions at RAND— with Hitch, Rowen, Wohlstetter, Marshall, and with his student, Daniel Ellsberg...⁴⁷

Kuhn's vision of the scientific community's dynamism as necessary in articulating a paradigm is exceptionally evident in Schelling's own description of RAND,

As a collection of people, RAND is superb, and I have mentioned above only the few whose intellectual impact on me was powerful and persistent; many others, truly to numerous to list here, have as individuals affected the final shape of this book. But RAND is more than a collection of people; it is a social organism characterized by intellect, imagination, and good humor.⁴⁸

It is unnecessary to further separate and classify individuals within the strategic community. For the purposes of this argument, it is only important to recognize that there is indeed a group of like-minded (in terms of subject of interest, not necessarily conclusions regarding that subject) individuals

46 Curtis E. LeMay, cited in James Digby, *Strategic Thought at RAND, 1948-1963: The Ideas, Their Origins, Their Fates*, N-3096-RC, (Santa Monica, CA: RAND Corporation, 1990), 4.

47 Digby, *Strategic Thought at Rand*, 22.

48 Thomas Schelling, preface to *The Strategy of Conflict*, cited in Digby, *Strategic Thought at RAND*, 23.

working to critique, articulate and further clarify issues of this special sort. A strategic community does exist.⁴⁹

C. THE STATUS OF STRATEGY AS "SCIENTIFIC"

Kuhn's impact upon the academic world was not ignored by political and social scientists. Though Kuhn has in mind the natural sciences as his primary milieu, it is the idea of this paper that his ideas speak significantly to strategy formulation, i. e. war preparation, as well. It must be stated at the outset of this analysis that Kuhn himself questions the status of social science as a science. He states,

...and it remains an open question what parts of social science have yet acquired such paradigms at all. History suggests that the road to a firm research consensus is extraordinarily arduous.⁵⁰

Strategic theorizing is a social science. This notion is implicit in Bernard Brodie's statement, "That strategic theory is reducible to a few common-sense propositions does not distinguish it from other social sciences...(my emphasis)."⁵¹ As policy and strategy-making fall under the rubric of social science, it seems that the nuclear strategic process is called into question as well, in terms of having achieved a paradigm. It is also important to note that

49 Liklider's *The Private Nuclear Strategists* seems to be one of the defining works on the subject. He cites others who have done work on the nature of this community as well: Gene M. Lyons, Morris Janowitz, Bruce L. R. Smith, Alice Kimball Smith and others. Though these thinkers do not focus on the nature of the community in a Kuhnian context, their analyses are very useful in doing so, if only in establishing nothing more than the existence of a strategic community in a generic sense.

50 Kuhn, *Structure*, 15.

51 Bernard Brodie, "Strategy As A Science." *World Politics* 1, no. 4 (July 1949), 475.

Kuhn in no way precludes the possibility of social science to fully develop a paradigm. So, even if it is not established as to whether a particular discipline has fully developed a paradigm, the potential exists for it to occur at some stage.

This paper does not argue that the nuclear-strategic endeavour to date has articulated any kind of mature and coherent paradigm. It does however, posit that the activity of nuclear strategizing is in the process of developing its paradigm and as such can be seen as a normal science, and thus, necessarily evolutionary.

The process occurring within the confines of normal science is an iterative one, a process that is constantly seeking to better define and redefine its terms, and to better phrase its questions. Nuclear strategy is still in the early stages of the development of a "new" science. Kuhn writes a description of the paradigm-less stage of a science which may be helpful in understanding the strategic process better. He says,

History also suggests, however, some reasons for the difficulties encountered on that road [to a research consensus]. In the absence of a paradigm or some candidate for paradigm, all of the facts that could possibly pertain to the development of a given science are likely to seem equally relevant. As a result, early fact-gathering is a far more nearly random activity than the one that subsequent scientific development makes familiar.⁵²

This passage paints a picture of the pre-paradigmatic stage of normal science development as undelineated and proto-plasmic. The body of facts,

⁵² Kuhn, *Structure*, 15.

phenomena and observation lacks a meaningful coherence, or ordering principle.

Yet nuclear strategists do not exist and work in an environment which is so entropic. Nuclear strategy by no means operates within a fully developed paradigm as yet, but it is not chaotic either. A nuclear strategic community does exist; and this community is working toward a coherence which will move it toward (perhaps never to attain) consensus. It may be the case that the strategic discipline will remain broken up into several "schools," as Charles Glaser or Robert Levine would argue, and never approach unanimity of world-view. Yet is important to remember that science evolves, and revolutions occur by better articulating and challenging theory. The potential for anomaly must exist in order for the science to grow. Unanimity may be a pipe dream. Perhaps the lack of it in the nuclear strategic community is a good indication of progression.

D. AN ANALYTIC FRAMEWORK

Holt and Richardson paraphrase Kuhn as they define a paradigm as "...a pattern or framework that gives organization and direction to a given area of scientific investigation."⁵³ A paradigm is composed of 6 elements: (1) a conceptual element, (2) a theoretical element, (3) rules of interpretation, (4) puzzle identification, (5) criteria of puzzle solution admissibility, and (6) ontologic-predictive element.

53 This description is drawn largely from Robert T. Holt and John M. Richardson, Jr., "Competing Paradigms in Comparative Politics," in Robert T. Holt and John E. Turner, eds., *The Methodology of Comparative Research*, (New York, NY: The Free Press, 1970), 21-71.

The definition of the *conceptual element* is a bit abstract. Though the concept must have some empirical reference, it is judged not upon its truth value, but upon its theoretical utility, or, how well it does in explaining or predicting when fit within a theory. A conceptual element answers the question, "Of what is reality composed?" These elements are nothing more than what the mathematician John Kemeny calls "free creations of the human mind which have proved useful for the formation of theories about experience."⁵⁴ It is apparent then, that while able to be defined, the conceptual element is most meaningful when looked at when used within a theory which is subsequently used to explain or predict. "Crisis stability" can be seen as an example of a strategic concept.

The *theoretical element* is actually a composite of several ideas, all of which are connected to that of theory. A theory is a "deductively connected set of propositions, which are, depending on their logical position with respect to one another, either axioms or theorems."⁵⁵ The distinction between axioms and theorems is not particularly important here, but it should be realized that the propositions which are logically connected, be they axiom or theorem, are composed of the conceptual elements.

The theoretical elements can be subjected to various tests of empirical verification or falsification. Truth value is assigned to a proposition thereon. Since a theory is merely a construct of conceptual elements, it cannot really be said to exist independently, (though this has been disputed by

⁵⁴ John G. Kemeny, *A Philosopher Looks at Science*, (Princeton, NJ: Van Norstrand Publishers, 1959), 138.

⁵⁵ Holt and Richardson, *Comparative Research*, 24.

metaphysicians for centuries). Therefore, a theory cannot be falsified or verified *per se*. Its predictions however, can be, as those predictions are reflective of the observable world. *Rules of interpretation*⁵⁶ are the third element of a paradigm and tell the scientists how best to use language to describe observation, and how to use observation to falsify or verify the theories' predictions.

The *puzzle solving* element of a paradigm is important because it involves a consensus of the community deciding upon which questions merit response, so as to better expand, focus and delineate the paradigm holistically. The solutions of the puzzles must have a *criteria of admissibility* which is derived from the theoretical/conceptual context of the paradigm.

The question that must be posed to the scholar who has formulated a particular "solution" is not simply, can this formulation be derived from *some* set of general premises and rules of interpretation, but rather can it be derived from that set of general premises and rules of interpretation that are defined by the paradigm.⁵⁷

If the question is asked, the answer must be formulated within the context of the paradigm. If the answer involves the formation of new concepts, and theorems derived therefrom, and these are not derivable from the existent paradigm, but from some other as yet undefined conceptual/theoretical body, then the potential for crisis and subsequent revolution exists. A new paradigm must be formulated which can answer the question, and all others that went before.

56 These rules of interpretation are akin to what the positivists would call "correspondence rules."

57 Holt and Richardson, *Comparative Research*, 26.

The sixth element of a paradigm is the *ontologic-predictive* element. This is much less explicit than the preceding five but represents the paradigm as it would look if articulated fully. It defines the boundaries of the puzzles, and it suggests what a full set of laws might look like. In essence it is the vision of the scientist that a solution exists in full which drives him to further develop his work. It is the intuitive knowledge that once articulated, the paradigm will serve to answer any and all relevant questions with no probability of crisis. It is the inspiration derived from the realization of the possibility that an answer may be the answer.

E. CONCEPT AND THEORY

Holt and Turner's conceptual, theoretical and rule interpretational elements of a paradigm all make sense within the nuclear strategic endeavour. Indeed, much of what "normal" strategic theorizing does is defining and articulating these elements. Concepts and theories are manipulated in order to attempt to answer the paradigm's core puzzles, or questions.

The following passage is an argument which "proves" that crisis stability can be adjusted as a function of survivability.

For a crisis to be stable, the incentives to preempt must be low. The lower the incentives to preempt, the more stable the situation is. The most stable situation then, is one wherein exists no incentive to preempt for either side. Of course, that scenario only exists as an ideal type, because it implies no vulnerabilities on either side; and this is unrealistic. It does point to an important concept however. If the logic above holds, then decreasing vulnerability results in increasing crisis stability. Increasing survivability equates to decreasing vulnerability. Thus, increasing survivability will result in increasing crisis stability. As mobility leads to survivability, mobile systems will improve crisis stability.⁵⁸

The argument may or may not be considered dubious. It does not matter for the purposes here. The passage above does demonstrate the existence of theory and conceptual tools in the world of nuclear strategy.

It is simple to pull some concepts from the passage: "crisis stability," "preemption," "incentive," "vulnerability," "survivability," and others. These are just words, but they signify meaning, meaning which is important in answering various questions. Uttering of these word/concepts alone does not make an argument. However, if two or more concepts are connected using standard logical tools,

- The Minuteman III system is either survivable or vulnerable.
- Minuteman III is not survivable.
- Therefore Minuteman III is vulnerable.
- Increased vulnerability equates to decreased survivability.
- Decreased survivability results in decreased crisis stability.
- Thus Minuteman III results in decreased crisis stability.

Thus arguments can be formed.

⁵⁸ This is my own formulation of the argument taken from my final paper, a critique of Scott Sagan's *Moving Targets*, for Professor Wirtz's NS 3280 class. It is by no means unique, and apparently, given contemporary US strategic procurement policy, not the least convincing.

The logic used in this syllogism cannot be questioned with any authority. If all premises are true, then the conclusion is true as well. This argument is composed of concepts and theories. These are used, connected by various logical operations, to formulate an argument. The argument would then be used perhaps, to affect strategic policy in terms of procurement and posturing.

Upon being exposed to this argument, nuclear theorists would respond as normal science dictates. They would eviscerate the argument by questioning every angle of it. If Colin Gray were to read such an argument he would surely think it the 'zenith of mongoloid reasoning!'⁵⁹ and then go on to lambast it roundly. One among many scathing criticisms might go something like this:

...to claim a blessing from the intellectual deity known as stability is the first resort of a scoundrel. Stability is a concept of very easy virtue, readily rented by those in need. As a candidate master concept, stability is sufficiently imprecise in its terms, conditions, and implications that it means whatever an unscrupulous debater wants it to mean.⁶⁰

Nuclear strategists can be a surly and pugnacious lot. Gray's commentary on the concept of "stability" is a good example of the kind of discourse that occurs daily in normal science as a paradigm is being more explicitly articulated. His questioning of a concept is no different from Einstein questioning the concept of the singularity.

59 Woody Allen, "Conversations With Helmholtz," from *Getting Even*, (New York, NY: Random House, 1966), 116.

60 Colin S. Gray, "The Definitions and Assumptions of Deterrence: Questions of Theory and Practice." *Journal of Strategic Studies* 13, no. 4 (December 1990), 6.

Einstein himself reluctantly admitted that singularities were mathematically possible in general relativity, but thought they were nonsense as far as the real world was concerned. After all a real physical object could never be squeezed down to a point, could it?⁶¹

Both are trying to come to grips with an entity that is supposedly useful in describing and explaining phenomena in their fields of inquiry. Both are questioning the concept's utility; and the questions asked may result in further explication of the concepts, possible adjustments made in supporting theory, and perhaps, increased utility within the paradigm.

There can be little doubt that concepts and theories do exist in the arena of nuclear strategy. Their functions are the same as those in any "hard" science. It is the case that many of the concepts and theories in the social science do not lend themselves as easily to quantification and applicability of analytic techniques. But to be called "scientific" does not require such criteria. What is required is reasonable discourse by a group of conceptually focused, hopefully inspired, thinkers, and the potential to evolve from its discourse.

Holt and Turner's analysis of Kuhnian science is a useful one. The conceptual and theoretical elements of the paradigm are important but not particularly novel. It is important to realize that the conceptual/theoretical/rules of interpretation elements of the paradigm are key elements in any vision of science. In fact, the positivists were accused of too myopic a view in this regard. They would concentrate fully upon concept, theory, and rules of correspondence between observation and language, and

61 Dennis Overbye, *Lonely Hearts of the Cosmos: The Story of the Scientific Quest for the Secret of the Universe*, (New York, NY: HarperCollins Publishers, 1991), 90.

then make judgements upon the ontological grounding of their arcane ministrations. Kuhnian science is concerned with the human element, the sociology of scientific knowledge. Important to Kuhnians is the interaction and consensus-building, or consensus-wrecking occurring within the paradigm.

F. PUZZLES

Concepts and theory are used to answer questions. These questions bound the paradigm. These questions are what Holt and Turner call "puzzles." As normal science progresses, the concepts and theories used to solve the puzzles are more accurately articulated, this articulation coming in the form of re-definition, or responses to critique, such as Colin Gray's critique of stability, for example.

To further connect Kuhnian science to nuclear strategy, in light of the above, it needs to be shown that a body of questions, or "puzzles," exists for the nuclear strategists. Charles L. Glaser, in an essay entitled "Why Do Strategists Disagree about the Requirements of Strategic Nuclear Deterrence?," in Lynn Eden and Steven Miller's edited volume, *Nuclear Arguments: Understanding the Strategic Nuclear Arms and Arms Control Debates*, separates the debate occurring within the nuclear strategic community. He divides the debate into three schools: Punitive Retaliation, Military Denial, and Damage Limitation. These three schools are defined by classifying the answers given to 6 very fundamental questions: (1) Will the Soviet Union risk nuclear war to expand?, (2) What assets does the Soviet Union value most?, (3) Can the US limit damage to itself in an all out war?, (4) What determines advantage between

superpowers?, (5) How does the difficulty of limiting a war affect deterrence?, and (6) What is required for crisis stability? ⁶² The answers to these questions not only determine which school one belongs to, but they also have a great bearing on weapons procurement and force posturing policies.

Looked at from the angle of this paper, these questions are profoundly important. They are the core of the developing paradigm. Of course, these specific questions are not dictated to the community by any higher power. They do represent however, the broad spectrum of issues which strategic theorists and planners grapple with. So, this base of questions should be looked at as reflecting the various "puzzles" which have been determined to be of importance by the community. For example, few would argue that Russian goals and motives are not important; and it would be silly to think that attempts at analyzing the possibility of limiting nuclear war are inconsequential.⁶³ These fundamental questions, rather their breakdown, will ultimately allow entrance to contemporary strategic theory, a theory which, it will be argued, is caught in the quagmire of crisis.

Science has Truth as its goal. Paleontologists work to determine whether the dinosaur extinction occurred due to a potent virus, a volcanic eruption, or the impacting of Earth with a comet. The answer may be one, or could be all of the above, but there is an answer. Paleontologists are manipulating the analytical tools of their paradigm according to certain rules

62 Charles L. Glaser, *Nuclear Arguments: Understanding the Strategic Nuclear Arms and Arms Control Debates*, Eden, Lynn, and Miller, Steven E. , eds. , (Ithaca NY: Cornell University Press, 1989), 114.

63 I believe Glaser omitted one very important question, "What is required for extended deterrence?," but nevertheless, the list is still very comprehensive in scope.

and are trying to discern what really happened. Similarly, nuclear strategy has as its goal a truth as well. Except, rather than seeking to define a discrete fact, such as the cause of the dinosaur extinction for example, nuclear strategy attains to a more normative, less objective ideal, it aims to find a "best" way to maintain the territorial, political, and cultural integrity of the United States within the nuclear environment. The quest for the "best" strategy is evolutionary. Many thinkers have offered their visions as to the right way to maintain the security of America; but this discourse has varied and adapted as the cultural, technological and political environment has changed.

G. NUCLEAR EVOLUTION

Recall that Kuhnian science is both evolutionary and revolutionary. It is evolutionary when it is "normal science," as the existing paradigm is moving and adapting and struggling to more explicitly articulate concepts and theories and/or reconcile anomaly within the bounds of the paradigm. It is revolutionary as it meets anomaly, is unable to square it with the existing tools of the paradigm, goes into crisis, and emerges again to be able to deal more effectively with reality. So if one is to look at nuclear strategy as resembling Kuhnian science, he must be able to identify both evolutionary trends, and their causes, and the potential for crisis and ultimately revolution, through identification of anomaly.

This section of the paper is not an attempt to comprehensively review US strategic nuclear history, indeed, it is not necessary. What needs to be shown however, is the evolutionary progression that strategy follows. A

science evolves as its concepts, theories, and products are criticized and explicated. Evolution in science equates to articulation.

It makes sense at this juncture to identify and, hopefully, resolve a rather obvious criticism of the evolutionary argument. It could be suggested that evolution as rational discourse, which is what the paper argues, is rather silly. Evolution, it might be said, is response and adaptation to environment, just as Darwin suggested in 1859, and this is true. The analogy between doctrinal and biological evolution only goes so far however. An organism reacts to its environment, and changes physiologically, so to adapt without the catalyst of an internal or external "reason." A strategic doctrine, on the other hand, evolves through the conduit of Mind.⁶⁴

Leon Sloss and Marc Dean Millot posit three factors that have dominated the evolution of official US nuclear strategy: the changing nuclear balance, changes in technology, and a wider appreciation in Washington of Soviet views of nuclear war.⁶⁵ This seems an astute judgement. It brings to light though, the differences between evolution in the biological sense, and evolution of theory. Theory is a function of human, or at least intelligent, deliberation. Theory is adaptive only insofar as it is guided by reason. Certainly Sloss and Millot's strategic evolutionary causes are valid ones; but the scientific reason, and articulation of the paradigm comes more convincingly into play as thinkers attempt to come to terms with the effects

64 The idea for a need to differentiate between types of evolution was inspired by reading various essays from Stephen Jay Gould, *Bully for Brontosaurus: Reflections in Natural History*, (New York, NY: W. W. Norton & Company, 1991).

65 Leon Sloss and Marc Dean Millot, "US Nuclear Strategy In Evolution." *Strategic Review*, (Winter 1984), 26.

the new conditions or realizations have upon the body of theory and concept, and how they may best evolve doctrine. Doctrinal evolution thus, is a human process. One must be cautious in attributing direct cause to a phenomenon, (e. g. technological change) when in fact that phenomenon may be a step removed from Mind in the evolutionary process.

As a case study of this "evolution as articulation" idea in nuclear strategy, the period from 1961 to 1980 will be focused upon. The period begins with President Kennedy's displeasure with "massive retaliation," and moves into the McNamara doctrinal adjustments, President Nixon's declared chagrin at the relative rigidity of Assured Destruction doctrine, through the formulation of NSDM-242, past PD-18, and into President Carter's PD-59 and the Countervailing strategy.

President John Kennedy was briefed on the Single Integrated Operational Plan (SIOP) 62 on 13 September, 1961.⁶⁶ At the end of the briefing, Kennedy was dismayed at the significant lack of flexibility found therein. As a reaction to this seemingly monolithic and immalleable targeting plan, a reflection of the Eisenhower administration's "massive retaliation" idea, he ordered flexibility incorporated into the SIOP.⁶⁷

66 Scott D. Sagan, "SIOP-62: The Nuclear War Plan Briefing to President Kennedy." *International Security* 12, no. 1 (Summer 1987), 22.

67 It is interesting to note that JSTPS at least payed lip service to the idea of flexibility in SIOP-62, but their opinion was not convincingly in favor of it at all. They wrote "Notwithstanding the above, the current SIOP does have certain flexibility--some of which is built into the plan by design, and some of which, although not included in the design of the plan, is inherent in the mechanism for control of forces committed to the plan." [Sagan, *SIOP...*]

The Kennedy administration, which came into office on 20 January 1961, began with a complete and unequivocal rejection of the Eisenhower administration's basic national strategic policy of Massive Retaliation, which it chose to interpret as a wholly inflexible doctrine. One of its first acts was to order the revision of the December 1960 SIOP in order to provide the president with various options from which he could choose in the event of a nuclear exchange with the Soviet Union.⁶⁸

SIOP-63, which incorporated Kennedy's changes to SIOP-62,

...distinguished more clearly among...three tasks:...attack on (1) nuclear threat targets, (2) other military forces, and (3) urban-industrial targets. It also provided options for withholding attack by country and for withholding direct attack on cities.⁶⁹

After extensive consultation with key members of the strategic community, in this case Air Force BG Noel Parrish, and the RAND Corporation's William W. Kaufmann, regarding a Counterforce/No Cities strategy, Secretary of Defense McNamara subscribed to the plan.⁷⁰

McNamara received a briefing on counterforce/no cities from Kaufmann early in his tenure and seemed attracted by its possibilities as an alternative to massive retaliation as a nuclear response...Kennedy, McNamara, and Rusk apparently agreed with this position.⁷¹

Daniel Ellsberg, Frank Trinkle, and Alain Enthoven, all RANDites, were key players in revising the new SIOP. In order to provide the Soviet Union with

68 Desmond Ball, "The Development of the SIOP, 1960-1983." In *Strategic Nuclear Targeting*, eds. Desmond Ball and Jeffrey Richelson, (Ithaca, NY: Cornell University Press, 1986), 62.

69 Henry S. Rowen cited in Aaron L. Friedberg, "The Evolution of US Strategic "Doctrine"--1945 to 1981." In Samuel P. Huntington ed. , *The Strategic Imperative, New Policies for American Security*, (Cambridge, MA: Ballinger Press, 1982), 60.

70 Alfred Goldberg, *A Brief Survey of the Evolution of Counterforce*, RM-5431-PR, (Santa Monica, CA: The Rand Corporation, 1967), 17-25.

71 Ibid. , 25.

nuclear options other than a fierce and massive strike, Moscow was taken off of the US target list in late 1961.⁷² The flirtation with a no cities policy was brief. It suffered much criticism both domestically and from the US' NATO allies, and ultimately resulted in its replacement. Desmond Ball offers the following major criticisms:

(1) counterforce targeting implies a first strike, (2) the Soviets reacted with outrage to the idea that nuclear war could be executed with restraint; and they reaffirmed their own strategy of massive attack on both military and urban targets simultaneously, (3) NATO countries felt that counterforce targeting would deny European nuclear independence, and (4) the Air Force used the call to counterforce support a massive system procurement plan which would have been very costly.⁷³

The criticism of no cities was convincing enough to cause a shift into a targeting policy called Assured Destruction. Assured Destruction, a construct of McNamara's efficiency-oriented mind, relied on a criteria of cost effectiveness.

This doctrine held that a nuclear exchange would, with high probability, result in over 100 million fatalities in both the US and the USSR and that attempts to limit damage through active and passive defences could be readily defeated by improvements in offensive forces...The damage criterion settled on by McNamara for determining the size of the strategic force was the destruction of 20-25 percent of the Soviet population and 50 percent of its industrial capacity.⁷⁴

72 Desmond Ball, *Deja Vu: The Return to Counterforce in the Nixon Administration*, (California Seminar on Arms Control and Foreign Policy, Santa Monica, CA, December 1974), 12.

73 Ball, *Strategic Targeting*, 67-68.

74 Henry S. Rowen, "The Evolution of Strategic Nuclear Doctrine." In Laurence Martin ed., *Strategic Thought in the Nuclear Age*, (London: Heinemann, 1979), 146.

This idea of Assured Destruction continued throughout the remainder of the 60's. While McNamara pushed for Assured Destruction, he also did not ignore the counterforce damage limitation requirements championed by Lt. Col. Glenn Kent.⁷⁵ This synthesis of Assured Destruction and Damage Limitation resulted in a constantly swelling target list that, while perhaps more precisely defined in terms of a targeting agenda than SIOP-62, was similar in strategy. Hit everything, hard! Rowen affirms this,

...the nuclear planning process experienced no important change from the early 1960's until 1974. The assignment of weapons to a growing target list went on in accordance with the political direction established in the early '60's.⁷⁶

The Schiesinger Doctrine, Nixon's response to the strategic targeting monolith, would initiate one of the first major strategic changes with any kind of staying power.

It is important to note, in furthering the idea of evolution as paradigm development, that while the nuclear strategy in the '60, changed very little in practice, the intellectual seed of flexibility as a concept was introduced and developed rather robustly. The military officers from JSTPS who designed SIOP-62 recognized the importance of flexibility, though they did not like the idea too much at all. Kennedy recognized a need for flexibility and demanded that it be incorporated more fully into national strategic policy.

McNamara and his "brightest" studied the problem with the help of other members of the community and attempted to direct strategy toward a

⁷⁵ Ball, *Strategic Targeting*, 68.

⁷⁶ Rowen, *Strategic Imperative*, 61.

countervalue/no cities targeting scheme. Though this scheme was rejected after a brief period of being in vogue, and McNamara advocated the relatively rigid Assured Destruction doctrine thereafter, the Secretary still championed flexibility in response and countervalue targeting in his public statements. So, the seeds of flexibility never did die in the '60s. In fact they sprouted and resulted in what would become the Schlesinger Doctrine in 1974.

The idea of flexible nuclear options was rejuvenated in President Richard Nixon's annual foreign policy review of 25 Feb, 1971, in which he said,

...I must not be—and my successors must not be—limited to the indiscriminate mass destruction of enemy civilians as the sole possible response to challenges. We must insure that we have the forces and procedures that provide us with alternatives appropriate to the nature and the level of the provocation. This means having the plans and command and control capabilities necessary to enable us to select and carry out the appropriate response without necessarily having to resort to mass destruction.⁷⁷

Assured destruction was excessively rigid, especially in response to emerging Soviet technological breakthroughs. As the rigidity became more pronounced, the credibility of the posture also waned. It was argued that massive countervalue attacks could act as a self-deterrent in the face of various potential forms of Soviet aggression.⁷⁸

Early in the Nixon administration, a set of studies was undertaken which concerned limited nuclear targeting options. The results of these studies were codified in National Security Study Memorandum (NSSM)-169, and

⁷⁷ Richard M. Nixon, cited in Sloss and Millot, 20.

⁷⁸ Sloss and Millot, 22.

this led to National Security Decision Memorandum (NSDM)-242.⁷⁹ Secretary of Defense James Schlesinger publicly outlined some elements of the new targeting doctrine in his FY 1975 Defense Department Report, hence it came to be known as the "Schlesinger Doctrine."

It is important to realize that James Schlesinger came from a strategic environment of great vitality. He spent 6 years (1963-1969) as a weapons systems analyst at RAND. It is reported that he became "haunted by Strangelove scenarios of accidental nuclear confrontation," and so began to explore other alternatives more vigorously.⁸⁰ His vision of nuclear warfare, cultivated at RAND left no doubt as to why he would later call for such an intense focus on flexibility and counterforce.

Given the prospective strategic balance, with the potential for devastation embodied in the forces that would survive a disarming attack, it becomes very hard to envisage nuclear war being initiated suddenly with all-out strikes. If it were to come it would be in a sequence of escalating steps from a lower-level confrontation.⁸¹

The Schlesinger Doctrine was comprised of three basic elements: (1) escalation control, (2) a secure reserve force, and (3) counter-recovery targeting.⁸² The concept of *escalation control* was critical for the new policy. It was deemed necessary that the NCA be able to deliberately control the progress of a nuclear exchange. The memorandum stated that the US must be

79 Jeffrey Richelson, "PD-59, NSDD-13 and the Reagan Strategic Modernization Program." *The Journal of Strategic Studies* 6, no. 2 (June 1983), 128.

80 Ball, *Deja Vu*, 33.

81 James Schlesinger, in Ball, *Deja Vu*, 33.

82 Sloss and Millot, 22-23.

able to "hold some vital enemy targets hostage to subsequent destruction" and to have control of "the timing and pace of attack execution, in order to provide the enemy opportunities to consider his actions."⁸³

Implicit in the above is the need for a *secure reserve force*. This force would hold targets hostage while incremental steps of escalation or termination are being carried out. In his FY 1975 Report, Schlesinger stated,

With a reserve capability for threatening urban-industrial targets, with offensive systems capable of increased flexibility and discrimination in targeting, and with concomitant improvements in sensors, surveillance, and command-control, we could implement response options that cause far less civilian damage than would now be the case.⁸⁴

The last major element of NSDM-242 was the specification that if escalation was not controllable, the US should target the Soviets so to *impede Soviet recovery*.

The objective of such an attack would be to delay for as long as possible the Soviet Union's recovery to the status of a major military and economic power. This strategy...specified the destruction of 70 percent of the Soviet economic recovery base.⁸⁵

This is important for two major reasons. First, it was the first time that official word was promulgated which set post-war objectives. Second, and most importantly it represented the introduction of a concept which was

⁸³ Ball, *Strategic Targeting*, 72.

⁸⁴ James Schlesinger, "Annual Defense Department Report 1975." In Philip Bobbit, Lawrence Freedman, Gregory F. Treverton eds., *US Nuclear Strategy*, (Washington Square, NY: New York University Press, 1989), 382.

⁸⁵ Jeffrey Richelson, "The Dilemmas of Counterpower Targeting." In *Comparative Politics* 2, no. 3 (1980), 224.

interesting and useful as a theoretical entity. It fit well within the new counterforce flexibility doctrine, however, it was not subject to the intense critical scrutiny which should normally occur upon introduction of so dramatic an idea into a community of thinkers. Nevertheless, this counter-recovery notion drove US targeting and procurement policy.

This priority counterindustrial recovery strategy produced a huge analytical effort to understand Soviet economic recovery capabilities after a nuclear war. The resulting studies showed that significantly larger numbers of weapons were required to achieve the counter-recovery objective.⁸⁶

As soon as the Carter administration took office, the President initiated a review of strategic policy. The result was known as PD-18 and endorsed the main elements of Nixon's NSDM-242 as articulated to that point, pending further review. The directive also ordered studies to be carried out on the subjects of targeting policy, C3I requirements for the reserve force, and counterforce capabilities which focused on the MX missile system.⁸⁷

As part of the targeting review, PD-18 deemphasized the counter-recovery targeting aspect of the plan. As alluded to above, this shift in emphasis reflected the fact that proper study into the real meaning of counter-recovery targeting had not taken place when the policy was first incorporated.

86 Scott D. Sagan, *Moving Targets: Nuclear Strategy and National Security*, (Princeton, NJ: Princeton University Press, 1989), 46.

87 Sloss and Millot, 24.

Studies undertaken between 1975 and 1978 highlighted the extreme difficulties inherent in determining with any confidence how recovery would progress after a large scale nuclear attack. The problem of recovery from a large scale nuclear war was simply not well understood...⁸⁸

Michael Kennedy and Kevin N. Lewis point out that,

...some prominent assessments in the open literature have alleged that the USSR can recover from even an all-out US strike in the short interval of four years at the least, and on up to fifteen years at the outside, depending on the severity of the US attack and the performance of Soviet active and civil defenses.⁸⁹

It seems clear that when NSDM-242 introduced the idea of counter-recovery targeting, it had not been explored thoroughly by the community using the appropriate analytical, and qualitative techniques.

The problem with counter-recovery targeting well illustrates the evolutionary nature of US targeting doctrine, and strategy as a whole. Though CR targeting was incorporated into strategy a bit hastily, it was nevertheless subsequently explored. It was found wanting and the appropriate changes were made in policy. Thus, does evolution occur.

After the studies ordered by PD-18 were completed and decisions were made, President Carter signed PD-59. The policy contained in PD-59 came to be known as the "countervailing strategy." Harold Brown outlines the intellectual guidance of countervailing strategy in his address to the Naval War College on 20 August 1980:

⁸⁸ Ibid.

⁸⁹ Michael Kennedy and Kevin N. Lewis, "On Keeping Them Down; or, Why Do Recovery Models Recover So Fast?." In Ball and Richelson, *Strategic Targeting*, 194.

We must have forces, contingency plans, and command and control capabilities that will convince the Soviet leadership that no war and no course of aggression by them that led to the use of nuclear weapons—on any scale of attack and at any stage of conflict—could lead to, victory, however they may define victory. Firmly convincing them of that fundamental truth is the surest restraint against their being tempted to aggression.⁹⁰

PD-59 reflected the necessary changes resulting from the PD-18 studies. This directive altered US strategy in two basic ways. First, it called for a shift in targeting emphasis from the economic counter-recovery targeting emphasis called for in NSDM-242 to Soviet strategic military, leadership, and other military targets. Second, it called on strategists to develop the capability to fight a war which could be protracted (lasting months), rather than one which would last only a matter of days.⁹¹ Compared to previous strategies, Harold Brown saw the biggest difference in PD-59 as the fact that PD-59,

...is a specific recognition that our strategy has to be aimed at what the Soviets think is important to them, not just what we might think would be important to us in their view.⁹²

The countervailing strategy has undergone little change from its inception to the present day. SIOP-6, of 1 October 1981, was the first to incorporate the elements of PD-59 by including the concept of protracted nuclear war, increased emphasis on targeting leadership and relocatable targets, and elimination of the counter-recovery mission. SIOP-6F, of 1

90 Harold Brown, in Bobbit et. al. , *US Nuclear Strategy*, 411.

91 Richelson, "PD-59..." , 128.

92 Harold Brown, in Sagan, *Moving Targets*, 49.

October 1989, emphasized prompt counterleadership options and the development of "adaptive target planning."⁹³

The idea of evolution as articulation of conceptual and theoretical elements in the effort to answer the important paradigm-defining questions can be seen in two profound ways in the preceding survey of strategic history. It can be seen in the iterative process of developing the concept of flexibility, and it can be seen in a "new" look at deterrence under Harold Brown and the Countervailing Strategy. Brown's statement, that the US must be able to menace, "what the Soviets think is important to them..." This statement is important because it represents official recognition that the US over the previous years may have been applying its own values to the Soviet Union⁹⁴, assuming that it would react as the US would if faced with the same peril. In an evolutionary sense, this statement represented an adjustment in the way that the US thought about the concept of deterrence.

It is imperative to note that the preponderance of individuals who write about strategy and strategic history see the progress as evolutionary. It is doubtful whether they look at evolution in the sense of paradigm articulation and Kuhnian normal science, but nevertheless, they see it as evolutionary as relative to some criteria. Aaron Friedberg, speaking of strategic prescriptions for 1982 and beyond, says,

93 Desmond Ball and Robert C. Toth, "Revising the SIOP: Taking War-Fighting to Dangerous Extremes." In *International Security* 14, no. 4 (Spring 1990), 67.

94 I realize that Brown's statement is not a particularly profound one. The notion of the importance of determining the deterree's normative orientation has been around for some time. The fact that the statement was public though, seems to be important in terms of paradigm development.

But it should be clear by now that the necessary changes really involve a shift in emphasis more than they do a dramatic intellectual counterrevolution in which all modern concepts are banished to the garbage heap of history.⁹⁵

Sloss and Millot, commenting on the period from 1960-1980 submit, "As one looks back over the past two decades, changes in US nuclear strategy, although incremental and evolutionary, have had a significant, cumulative effect."⁹⁶ Jeffery Richelson posits,

[PD-59] does represent, as Carter Administration secretary of Defense Harold Brown claimed, an evolutionary rather than revolutionary shift in US targeting policy. Evolutionary rather than revolutionary in that what is being altered is the targeting emphasis rather than the target sets per se.⁹⁷

Other examples of officials and authors positing the evolutionary tendencies of US nuclear strategy exist. The importance of this discussion is simply to demonstrate that even analysts who are not using any kind of formally operationalized criteria of paradigmatic development see the history in the same way.

Two examples of Kuhnian evolution stand out from the historical discussion above. First, the concept of flexibility in response was offered by the military officers in JSTPS who prepared S*OP-62. They did not support flexibility, but they did introduce it as a concept officially, and as such, if the history of the SIOP and the discussions and argument surrounding its formulation are followed, one will see the presence of flexibility to the

95 Aaron Friedburg, *Strategic Imperative*, 92.

96 Sloss and Millot, 26.

97 Richelson, "PD-59...." 130.

current day. Flexibility is a concept; as such the community will respond to it by explicating and attempting to fit it into existing theory. (For example, analyzing how "flexibility" affects credibility and how this change in credibility, if any, would impact upon the deterrence calculus). This was done. To pirate and adjust the words of the anonymous Columbia professor quoted by Warner Schilling, "What in the name of God is "flexibility" and what can you do with it?"⁹⁸ This is asked facetiously, but it is intended to drive home the point that the strategic community, or any scientific community, is responsible for critiquing the new concepts and theories and exploring their possibilities. If the question of what to do with flexibility had never been asked, likely the fallacy of counter-recovery targeting would never have been discovered. And normal science occurs, the paradigm develops.

Adam M. Garfinkle, in his "The Attack on Deterrence: Reflections on Morality and Praxis," makes the case, drawing heavily from the philosophical lexicon of the esteemed humanist, Ernst Cassirer, that the concept of deterrence has moved through 3 three cognitive phases since the mid-40s: mimetic, analogic, and recursive.⁹⁹ The mimetic stage "was characterized by the assumption that deterrence was a condition discovered about a new technical reality of the war." The analogic stage "was characterized by the realization that human choices and volition effected the deterrence

98 Anonymous Columbia University professor, in Warner Schilling, "US Strategic Concepts in the 1970's: The Search for Sufficiently Equivalent Countervailing Parity." From Steven E. Miller ed., *Strategy and Nuclear Deterrence*, (Princeton, NJ: Princeton University Press, 1984), 184.

99 Adam M. Garfinkle, "The Attack on Deterrence: Reflections on Morality and Strategic Praxis." In *Journal of Strategic Studies* 12, no. 2 (June 1989), 168.

relationship." In this stage deterrence evolved from a condition to a theory about a condition. The recursive stage is characterized by the realization that "our definitions and conceptions of deterrence are not derivative of technological change, but central to and definitive of the relationship itself."

This is extremely interesting because first, it is agreement with the main premise that the notion of deterrence, as a concept to be articulated, is evolutionary. But it is even more interesting in the implication that the strategic community, as the group who works with definitions and conceptions, can act to define the relationship itself. The planners and doers of the community can change the condition by altering the concepts. In a sense he is saying that the community can guide the process in whatever direction it wants. But in a deterrent relationship, it would appear that it takes two to come to a consensus about which direction to proceed. Finally, and dramatically, in a Kuhnian context, at least as applied to the "social sciences," the community can bring about its own revolution. This is a bold notion put forth by Garfinkle and one that merits consideration. It seems however, that, that there may be a bit more technological determinism than he admits. The massive destructive potential of nuclear weapons causes the adjustment of concepts and definitions within the community to be a bit conservative. Nevertheless, the lesson that theory is dependent upon the corpus of observers is not lost.

H. REVOLUTION

If the strategic process is to be looked at as akin to the scientific process, then the potential for revolution must be demonstrated. Of course this can be

done theoretically by saying that revolution occurs when the concepts become meaningless or non-coherent, or the puzzles which define the paradigm have fallen into crisis. As luck would have it (for pedagogical purposes of course!), the US strategic community is today in the throes of a crisis unlike any ever experienced before.

The events of 1989-1991 in the communist world have shaken the international order. Expert commentaries abound. What is remarkable is that the events fit very well into the Kuhnian model presented in this paper. It was stated earlier that a paradigm is defined by the puzzles it sets out to solve. As long as those puzzles remain unanswered, and an answer seems attainable, the paradigm will move forward. Charles Glaser's taxonomical questions were used as an example of paradigm-defining questions. Given the shakeup in the world today, it is useful to look once again at these core questions. (1) Will the Soviet Union risk nuclear war to expand?, (2) What assets does the Soviet Union value most?, (3) Can the US limit damage to itself in an all out war?, (4) What determines advantage between superpowers?, (5) How does the difficulty of limiting a war affect deterrence?, and (6) What is required for crisis stability?

This body of questions does not carry the same intensity as it might have in the early 1980's. The strategic community is in crisis because the questions have changed. Instead of asking if the Soviets will risk war to expand, it seems more reasonable to ask, "Who is our enemy?" Instead of asking what determines advantage between superpowers, it may make more sense to ask, "In a multi-polar, economically diffuse world, does NATO make sense any longer?" Instead of asking about limited nuclear war, perhaps one

should ask about nuclear warfare's real effects on the ecological environment. The discipline is in crisis. The puzzles no longer seem to be important. But the new puzzles have not been defined yet. That process has started though. Of course the possibility exists that the crisis will be resolved within the old paradigm, but most feel that is unlikely. The nature of the "new normal" (post-revolutionary) science may be around the bend but no one knows what the nature of the puzzles, concepts or theories will be.

H. SUMMARY AND CONCLUSION

Science, as viewed from the unique and useful *weltanschauung* angle, heralded by Thomas Kuhn, is a process which operates according to a very unique dynamic. Concepts and theory are used in order to answer a set of questions which are deemed of essential importance by a semi-formalized community of thinkers. These concepts and theories are criticized, adjusted, manipulated, revised, and replaced by the community after having been addressed comprehensively. The body of concepts and theory, and the logical tools used to manipulate it in the effort to solve a variety of puzzles, comprise a paradigm. Paradigms evolve through criticism. Paradigms can also be transformed. They can become embroiled in crisis as they meet with a conceptual or theoretical anomaly which cannot be reconciled within the existing worldview. The nuclear strategic community, and its product, nuclear strategy, progress in the direction described above. This chapter has described how this is so.

The intent of this chapter has been to demonstrate a remarkable similarity between science and the nuclear strategic endeavour. It has not intended to

claim that nuclear strategy is a science, only that the strategic process follows a similar dynamic to the scientific process. If this basic congruence of science and strategy is accepted as, at least, remarkable, then war can be seen as scientific, but only insofar as it is relevant in explicating the preparation process for war. It should be evident from this chapter and the last that what has been described, i. e. the scientific dynamic does not describe the "conduct of war." In addressing war's conduct, the argument is brought to a new level, a bolder phase of contemplation— that of art and genius.

IV. WAR AS ART

A. INTRODUCTION

The previous two chapters have concentrated fully on defining a notion of science which intuitively runs against the grain of most men's conceptions of science. Thomas Kuhn represents the vision of science which is currently accepted by the philosophical community as most useful, and best substantiated. Though Kuhn has been subjected to much criticism since the publication of *The Structure of Scientific Revolutions*, his vision of science is well regarded and commented upon throughout the international academy. Science, as presented by Kuhn, is a process. To be considered scientific then, an endeavour must follow the basic evolutionary dynamic as offered previously. The process must reflect evolution as a temporal phenomenon, articulation as a quest for coherence. Science is an active process; it always strives to explain more. It is a function of Mind primarily, and seeks to attain Truth, nominally. In fact, the scientific process will never reveal Truth. Perhaps Art, in some esoteric way, does. Still, the Mind ventures forth to determine the next best thing, an epistemological coherence which describes and explains the world in the simplest, most comprehensive way possible. Through a special evolutionary process of, in some sense, cognitive flux, a paradigm is established.

The explication of Science and its application to strategy as presented previously should elicit at least two major responses from the reader. First, he should have a different, hopefully more compelling, view of science than the conventional, more Newtonian, conception of science as "product," and second, and most important, he should see that the notion of Science as presented does not describe the conduct of war very well. Art, as the act of Man "doing," does describe the conduct of war, and it is this idea of Art as physical discourse which will drive this section. Most of the path traveled thus far— an extensive discussion of Science— has been trodden so as to drive home the central idea that the conduct of war is not scientific in any important sense and that characteristics inhere in the sublime genius different from those of the heroic genius.

B. THEORETICAL STRUCTURE

Recall the theoretical breakdown of War into "preparation" and "conduct." Science is essential in describing the process of war preparation, through strategy formulation, and the entire bureaucratic planning morass. Strategy is indeed scientific. It is a community of experts trying to absorb the environment and establish a coherent framework for further activity using reason and analysis. The process does not stop. It is evolutionary, always being articulated further; it is a temporal phenomenon. Science never just "is." It is historical. Science is not graphs and charts, equations and supercolliders. These artifacts are merely tools used to grease the inner workings of an epistemological Juggernaut.

The conduct of war does not have Truth or cognitive coherence as its goal. It has victory as its goal, a very physical end. And victory, once the violence begins, can only come about by disarming the enemy, and ending the conflict on favorable terms. The conduct of war does not focus on the role of Mind and contemplation, as science does. Instead, it focuses on the role of Mind and physical action. This is not to say that the great captain in combat is not, or cannot be contemplative. He can. Action is not undertaken blindly. Action is driven by interest, and constrained by environment. So contemplation of these environmental variables certainly does occur. But it does so in a manner which is dissimilar to the "coherence-focused" mode of scientific thinking.

Clausewitz' conception of war pivots around what this paper argues is the "conduct" of war, as opposed to the preparation for war. As he was educated and wrote under the conception of science as preached during the Enlightenment, he would likely not be in harmony with the Kuhnian view of science as presented in this study. The fact that Clausewitz had a view of science different from that of Thomas Kuhn, however, does not negate any argument in this study as the thought of Clausewitz is being used primarily to demonstrate the more artistic facets of War.

For the Prussian, war was "an act of force to compel the enemy to do our will."¹⁰⁰ This quotation illustrates two very subtle, yet bold, points. First, there is the "act" of force. The conduct of war is just that, an activity which has very specific objectives, and myriad techniques. It is, as art is, the

100 Clausewitz, *On War*, 75.

"doing." *The Dictionary of Philosophy and Religion* defines art as "any purposeful making or doing."¹⁰¹ And it is as simple an observation as this which often becomes lost in the esoterica of thoughtful analysis. Second, there is the idea of compellance of an enemy. The act of war is not a unitary burst of self-expression acting upon a passive receptor. War's conduct necessarily involves the mutual action of both (or all) belligerents.

C. GENIUS AND THE CENTRALITY OF MAN

Yet it seems unsatisfactory to merely state that since the conduct of war is an activity, a "doing," it can be classified as an art. Brushing one's teeth or driving one's auto are also activities but would not be classified as artistic endeavours. Some further distinction needs to be made between types of activity. It will be argued that art, in its most generic sense, is indeed activity. But in the case of the conduct of war, art will transcend generic physical action to become more defined in terms of its relation to Genius. Indeed, Genius, as a reflection of Man, is the centerpiece of the entire analysis. If Man is claimed to be at the center of both the scientific process and the artistic enterprise, then it follows that Man and Mind, pushing the limits of creativity and originality in both sectors as the agent of Genius, should be the primary subject of inquiry. If war is to be classified as art, then it must be conducted by an artist. The uniqueness of the artist is his creative genius. Genius is an attribute of the human mind; and it is the human mind blessed with genius

101 *Dictionary of Philosophy and Religion*, (1980), s. v. "art."

which is necessary (though not sufficient) for victory in war.¹⁰² The diagram below illustrates this point.

¹⁰² Though genius, in my view, is not quantifiable, its intensity can be placed upon some sort of continuum however abstract. The actualization of genius is a function of the adversity of the environment and the goal desired. While the capable human mind is a necessity for victory, the mind imbued with genius as actualized is not. Conditions may provide the military commander with overwhelming superiority in numbers and technology in which case he would not need to initiate any extraordinary mental dynamic. The US-Iraqi war provides an example. This point will be expanded upon hence.

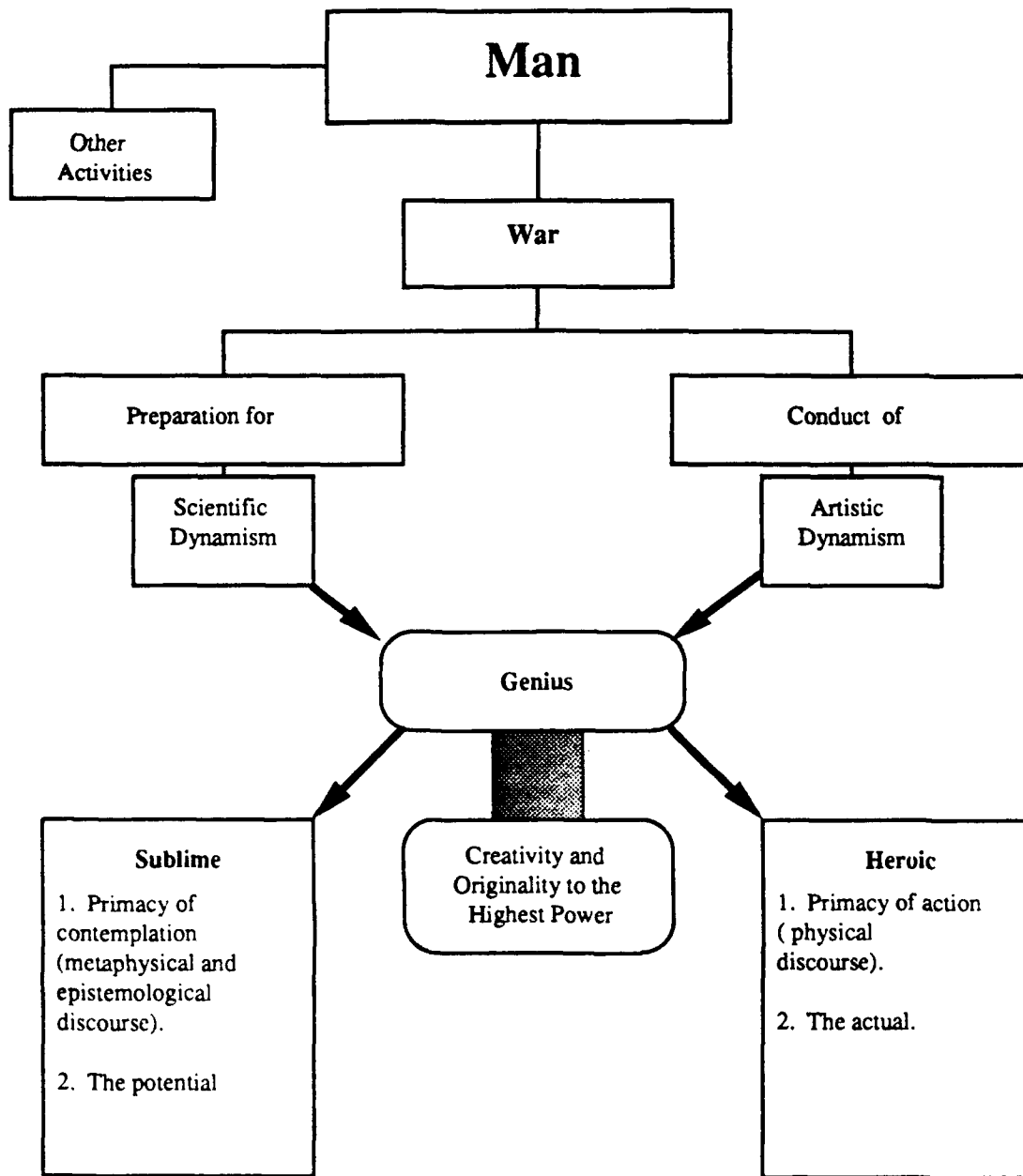


Figure 1 The Place of Man and Genius in War

It may seem pointless to state once again, in 1991, what Protagoras stated in the 5th century B. C. , that "Man is the measure of all things," but this very central philosophical notion, has transcended time, and done so aggressively.

This same idea has been expanded upon rigourously by Kant in the 18th century, applied to the military literature in a way that has not been matched since, by Clausewitz in the 19th century, and applied to the once revered "bastion of real knowledge," Science, by Thomas Kuhn, in the 20th century.

D. THE PRIMARY LESSON OF CLAUSEWITZ

The most profound proponent of this "military humanism" is without question, Carl von Clausewitz. Often called a "Philosopher of War," Clausewitz is in fact metaphysically nebulous, a confusing product of his intellectual environment. He implicitly synthesizes Scholastic Realism with Enlightenment reason flavoring them with an odd application of German anti-Enlightenment Romantic thought.¹⁰³

But despite this amorphous Clausewitzian metaphysic, the Prussian's masterwork, *On War*, transcends even the most intense philosophical rigour in its central message— the fundamentally profound importance of man's role in the conduct of war. To see Clausewitz' most important message as this recognition of Man's central role in war, however, is somewhat controversial. In fact, this vital humanistic aspect of Clausewitz' thought is often ignored when he is addressed in studies about war.

Indeed, in most military training programs, the only exposure that students would receive of Clausewitz is his famous dictum that "War is an

¹⁰³ I have argued this case in my unpublished NPGS, NS4261 seminar paper, "Metaphysical Tensions in Clausewitz' *On War*" of Spring 1991.

extension of politics by other means." While the connection between politics and war is exceedingly important, it is not exactly a novel idea today, nor was it profound in the 19th century. In fact, the importance of the politico-military relationship was revealed by such Classical thinkers as Plato, in his *Republic*, and Aristotle, in his *Politics*. Machiavelli was amongst the first to further define and elucidate the connection. Felix Gilbert notes,

Machiavelli is usually held to have introduced a new era, the modern era, in the development of political thought...It hardly goes too far to say that Machiavelli became a political thinker because he was a military thinker. His view of the military problems of his time patterned his entire political outlook.¹⁰⁴

Another example involves the Prussian General Friederich Constantin von Lossau, who, in his *War*, of 1815, two years before Clausewitz began to put *On War* to paper, stated, "Wars are therefore the exterior means of states to achieve by violence what they cannot achieve by peaceful means."¹⁰⁵ It should be evident that Clausewitz' dictum may borrow heavily from Lossau's articulation of a very similar idea, though the causal connection between the thoughts of the two men cannot be proven here. In terms of the politico-military relationship, it is very possible that Clausewitz can best be seen as a refiner and explicator rather than as a profound innovator.

For military thinkers of the present day, Clausewitz' gift should be thought of as his vision of the role of Man in war. It could rightly be thought

104 Felix Gilbert, *Makers of Modern Strategy: from Kachiavelli to the Nuclear Age*, ed. Peter Paret, (Princeton, NJ: Princeton University Press, 1986), 11.

105 Friderich Constantin von Lossau, cited in Azar Gat, *The Origins of Military Thought: From The Enlightenment To Clausewitz*, (Oxford, England: Clarendon Press, 1989), 242.

of as his most important, profound, and relevant avenue of inquiry. It opens up a new arena of intellectual exploration.

Yet it would still be unrealistic to think that Clausewitz was the first to recognize the role of Man in war. Most all military thinkers, both mainstream and arcane, have recognized the importance of the human element in war, yet only Clausewitz stands out as the premier military thinker of the last 200 years. Why? Why has the thought of Henri Jomini waned in influence, and that of Clausewitz thrived? The answer is simple. Despite the fact that Clausewitz lived 170 years ago, his thought process, and expression in prose fits remarkably well within the intellectual, and philosophical framework of the Western world today, especially the United States.

While many philosophical splinter groups are constantly attempting to articulate their views and spread the word to those willing to receive, mainstream Western philosophy may be best seen as a blend of American Pragmatism, Cartesian Rationalism, and neo-Kantianism.¹⁰⁶ The core point is a recognition that knowledge has very defined limits. All knowledge is a product of Mind, and while great consensus exists amongst thinkers, Absolutes cannot be demonstrated with certainty. Man is the bounding element in intellectual inquiry. Truth is not denied, but it is not claimed with any great intensity either. In other words there are limits to what can be described, explained and predicted. Clausewitz recognized this fact as it concerns War and what can be known about it. His theory of war recognizes this

¹⁰⁶ This statement alone is the stuff of more thesis topics. I do not attempt to prove this point as it is a bit out of this paper's purview.

fundamental limitation, and synthesizes it with War's observables, and other important conceptual entities.

Theory is thought by most scholars either to (1) describe, (2) explain, or (3) predict. Descriptive theory is the least complex of the three, and answers the "What?" question. The explanatory theory attempts to answer the "Why?" question, and involves a level of inquiry beyond mere description. The dynamics of an event or phenomena must be reconciled within a theory of causality which involves the focus of exploration. Predictive theory is the most difficult to get a firm grip on. This type of theory assumes absolutes. The ancient Egyptian predictions of the Nile River's ebb and flow were indeed accurate, but they assumed that because the river behaved in a particular way in the past, it would behave that way in the future as well. This is of course, logically fallacious.¹⁰⁷

Jomini failed to establish the intellectual longevity of a Clausewitz because he failed to recognize the limits of what a theory of war can do. Theory that involves the natural sciences, while subject to the same logical rules as any other theory, allows more accurate prediction because subjectivity can be minimized. Theories that involve the ministrations of humans are notoriously unreliable in terms of prediction. Jomini did not recognize the role of man as such a variable and potentially disruptive theoretical entity. He sought to extract absolute laws of war inductively from historical analyses of the Napoleonic battles and claim their immutability

107 This is an application of the well-known "problem of induction" as articulated by the Scottish philosopher David Hume in his *An Inquiry Concerning Human Understanding* (1748).

through all places and times. He articulated rules and laws. Clausewitz allowed for transcendence thereof. Azar Gat notes that,

Jomini claimed to have revealed the principles of Napoleonic warfare which were at the same time *also* the universal principles of the art of war. This double status was based on the belief that Napoleon's genius actually embodied the universal principles of war.¹⁰⁸

This passage reveals the fundamental difference in the competing thoughts of Jomini and Clausewitz. For Jomini, Genius (Man), in this case Napoleon, could not transcend the absolute laws of war. Genius could only attain to and ultimately become one with the Absolute. Jomini recognized the limits of human discourse, and it was the Absolute.

Clausewitz saw through the Jominian absurdity of absolutes in war, and did not provide for any great predictive potential in his theory. He recognized the limits of what could be said of war, because he recognized the limits of what could be said of Man. And this recognition of limitation, and the profundity of seeing that the existence of Man in war gave rise to this limitation, allows Clausewitz to be revered in the present day. Clausewitz, as shall be shown, did not recognize the Absolute as a viable metaphysical entity,¹⁰⁹ and thus Mind defined its own limitations, and could transcend any supposedly absolute laws of war.

¹⁰⁸ Gat, 119.

¹⁰⁹ Again, see my "Metaphysical Tensions..."

E. CLAUSEWITZ ON ART AND WAR

Art in war is a manifestation and application of heroic genius, as opposed to the application of sublime genius, the latter being most apparent in science. It is important to note before continuing that an exploration of art in war is in no way leading to a proclamation that war is in some way, "beautiful." The study of beauty is best left to the aesthetician. To speak of art in the context of war is merely to speak of the physical dynamic of human creativity.

Clausewitz begins his chapter, "Art of War or Science of War," by attempting to classify war. He does so by first specifying his terms as follows:

...call everything "art" whose object is creative ability, as, for instance, architecture. The term "science" should be kept for disciplines such as mathematics or astronomy, whose object is pure knowledge.¹¹⁰

He goes on to assert that war is more art than it is science but that it cannot be considered a pure art, for example:

The essential difference is that war is not an exercise of the will directed at inanimate matter, as is the case with the mechanical arts, or at matter which is animate but passive and yielding, as is the case with the human mind and emotions in the fine arts. In war, the will is directed at an animate object that *reacts*.¹¹¹

It follows then that for Clausewitz, war is a quasi-art. This is an unfortunate condition because Clausewitz is using the criteria that art must

¹¹⁰ Clausewitz, *On War*, 148. It is critical to note that the Clausewitzian conception of science is not congruent with the Kuhnian notion of science as described in depth previously.

¹¹¹ Ibid. , 149.

involve matter which is "inanimate" or "passive and unyielding." War is not a true art for Clausewitz because war involves an animate object which reacts—the enemy. In this sense war is special. But what Clausewitz does not mention is that the reactive subject of creativity, in the case of war, the opposing army, enhances the need for actualization of the commander's Genius. In some way, the violence and ambiguity of war requires a talent far beyond the manipulation of a willing, passive, medium. War is in some sense more artistic then, than the so called normal arts. I doubt that Clausewitz would find great fault in this statement.

War necessarily requires creative ability; it requires an exercise of the will. Paret cites an undated Clausewitz essay, "On Art and Theory of Art," that illustrates the possible link between art and war in the following:

Thus art is a developed [*ausgebildete*] capacity. If it is to express itself it must have a *purpose*, like every application of existing forces, and to approach this purpose it is necessary to have a means. ...To combine purpose and means is to create. Art is the capacity to create...¹¹²

Art has purpose. Art is the application of force. Art requires a means. Though war is not mentioned here specifically, it is simple to see the bold application of this passage. War has a purpose, requires the application of forces, and requires a means.

For Clausewitz, genius "refers to a highly developed mental aptitude for a particular occupation."¹¹³ This is a very pragmatic basic definition.

112 Clausewitz, "Über Kunst und Kunsttheorie," *Geist und Tat*, cited in Paret, *Clausewitz and the State*, 163.

113 Clausewitz, *On War*, 100.

Though it is not embellished with the linguistic *sturm und drang* transcendental flourishes of the day, it bears an interestingly close resemblance to Immanuel Kant's definition as articulated in his *Critique of Judgement*. For Kant,

Genius is the innate mental disposition (*ingenium*) through which Nature gives rule to Art....[It is] a *talent* for producing that for which no definite rule can be given; it is not a mere aptitude for what can be learnt by a rule. Hence *originality* must be its first property....¹¹⁴

Kant, the father and founder of German critical idealism is here laying the groundwork to a conception of art and genius which is to be later articulated much in parallel by the soldier Clausewitz.

Military genius, of course is the concentration of Clausewitz's efforts in *On War*. He claims that the generic "genius" of the philosophers is not useful in practice since it describes only a superlative degree of talent and has no measurable limits. Military genius involves,

...all those gifts of mind or temperament that in combination bear on military activity....Genius consists in a *harmonious combination of elements*, in which one or the other ability may predominate, but none may be in conflict with the rest.¹¹⁵

Given the focus of this paper, it is necessary to reflect briefly upon levels of genius in War. It would seem, from a purely theoretical angle, that Genius could occur at any level of a conflict. It can occur at the supreme commander's level as well as the level of the platoon commander. Historically,

114 Immanuel Kant, *Critique of Judgement*, cited in Ernst Cassirer, *An Essay On Man: An Introduction to a Philosophy of Human Culture* (New Haven, CT: Yale University Press, 1944), 227.

115 Clausewitz, *On War*, 100.

studies of military Genius have addressed those men who have exercised action which could affect the outcome of the campaign,¹¹⁶ men such as Hannibal, Napoleon, and Manstein. Of course it also needs to be recognized that in addressing the Genius in battle, one cannot ignore the potential for intense, situation-driven excellence at the tactical level.

In a chapter entitled "Moral Factors"¹¹⁷, Clausewitz asserts that the moral elements of 1. skill of the commander, 2. experience and courage of the troops, and 3. their patriotic spirit, are among the most important in war. He realizes the utter unpredictability of any synthesis of these elements and the fact that in combination they can lead to victory or defeat just as easily. This message is Clausewitz at his pithiest and most sublime.

Clausewitz recognizes that little has ever been written formally by strategists or military historians regarding the dynamic of moral force.¹¹⁸ He says,

116 Conversations with Professor R. H. S. Stolfi, 16 October 1991. It should be noted here as well that "genius" as used in much of this paper is simply generic intellectual capability. All humans have a level of genius as measured on some esoteric qualitative scale. Napoleon would score exceedingly high, a mongoloid would score incredibly low. The important subject of analysis is genius actualized in a certain manner, and the understanding of how that is so.

117 Clausewitz, *On War*, 184.

118 Raymond Aron, *Clausewitz: Philosopher of War* (Englewood Cliffs, NJ: Prentice Hall, 1985), 117, and Liddell Hart, *Strategy* (Frederick A. Praeger, 1968), 353, both praise Clausewitz for his recognition of the importance of the moral/psychological forces in war. Aron integrates the moral forces into a book which is itself constructed in a very Hegelian manner. Hart lambasts Clausewitz for the most part but does concede the Prussian's utility at least in so far as the human element is an important factor.

...it is paltry philosophy if in the old fashioned way one lays down rules and principles in total disregard of moral values. As soon as these [moral values] appear one regards them as exceptions, which gives them a certain scientific status, and thus makes them into rules. Or again one may appeal to genius, which is above all rules; which amounts to admitting that rules are not only made for idiots, but are idiotic in themselves.¹¹⁹

He seems to be saying that the only rule is that the implied grand, intellectually inspired rules are for idiots and are idiotic. He does not relegate war to the realm of utter chaos however. He recognizes, in prime Kantian fashion, that Genius lives above any rules or absolutes, and that the moral factors, functions of the inherently chaotic, yet high energy ambiguities of Mind, often change the rules in any case.

The German Army, esteemed purveyor of martial excellence, recognized this Clausewitzian and Kantian tenet. In a publication from the US Army War College regarding German Army War Games, *Generaloberst* Franz Halder states,

Contemporary military literature included unofficial manuals concerning the organization and direction of *Kriegsspiele*. In order to avoid even the slightest semblance of regimentation and to maintain full freedom in the application and the development of the war game, no instructions of this kind were issued by official sources.¹²⁰

This passage clearly illustrates the German emphasis on the commander's freedom on the battlefield. The German Army bred event-making men prior to WW II. It recognized the profundity of the Clausewitzian legacy of Man's

¹¹⁹ Clausewitz, *On War*, 184.

¹²⁰ Generaloberst Franz Halder, "German Army War Games," *Art of War Colloquium*, (Carlisle Barracks, PA: US Army War College, 1983), ix.

centrality in war, and the limitlessness of his Mind when subject to the chaos of the situation. The Germans bred doers.

Katherine Herbig, in her essay, "Chance and Uncertainty in *On War*," cites Clausewitz as he speaks of war's largely entropic—disorderly, bordering on chaotic—tendencies. Her discussion is presented here as an example of how not to think about Clausewitz' lesson:

War is more than a true chameleon that slightly adapts its characteristics to a given case. As a total phenomenon its dominant tendencies always make war a remarkable trinity-composed of primordial violence, hatred, and enmity, which are to be regarded as a blind natural force; of the play of chance and probability within which the creative spirit is free to roam; and of its element of subordination, as an instrument of policy, which makes it subject to reason alone.¹²¹

She claims that "If war is one part passion, one part chance, and one part reason, then the two of the three elements in its nature are by definition wanton, even uncontrollable."¹²² Herbig then goes on in her piece to pessimistically describe the primacy and pervasiveness of chance in war and of the fact that "we must assign to man's frail reason the remaining one third."¹²³

This view of man's role in war is one that at once infuriates and inspires the bolder and most astute readers. Given Clausewitz's vision of genius, Herbig misses the point by equating the three elements of passion, chance and reason. Reason, a tool of genius, is the element with primacy in

¹²¹ Clausewitz, *On War*, 89.

¹²² Katherine L. Herbig, *Clausewitz and Modern Strategy*, ed. Michael I. Handel, (Totowa, NJ: Frank Cass and Company Limited, 1986), 97.

¹²³ Ibid. , 115.

war. Chance certainly is pervasive; but it is, as Clausewitz said, where "the creative spirit is free to roam." Genius controls reason, and channels non-rational energies. It "roams" in the domain of chance in order to reign it in and achieve victory. Clausewitz is in celebration of the man, he does not subordinate man's role to the dictate of chance. He recognizes the difficulties presented by chance, uncertainty and friction, but does not equate their presence in a situation with futility. The intangibles are pervasive, and thus the qualitative effects will always have the potential for heroic influence.

The highly regarded philosopher and humanist Sir Isaiah Berlin offers an idea which seems appropriate in looking generally at the idea of Art, and further, usefully applies the Kantian and Clausewitzian idea that Genius dominates the Absolute.

When an artist is engaged in creating a work of art, he does not, despite naïve views to the contrary, transcribe from some pre-existent model...the song is what I compose or sing when I compose or sing it, not something independent of my activity; creation is not an attempt to copy some already given, fixed, eternal, Platonic pattern. Only craftsmen copy: artists create.¹²⁴

Examples abound of soldiers, as artists, creating. Though genius as the act of creation in war is not quantifiable, it most certainly can be placed on an abstract, intuitive continuum. Genius may preside in one person, or, genius as demonstrated by one person, may vary over time as a function of the contingency which causes that genius to actualize itself. This latter case is embodied by Napoleon Bonaparte.

¹²⁴ Isaiah Berlin, *The Crooked Timber of Humanity: Chapters in the History of Ideas*, (New York, NY: Alfred A. Knopf, 1990), 188.

Certainly, by most accounts, Napoleon was a military genius. This is to say fundamentally that the potential for the actualization of some level of a vast potential of intellectual power is everpresent. The level of genius exercised within any given situation is a function of the holistic sum of elements in that contingency. The artist in war, as creator, is not operating upon a passive medium. He is attempting to create, to form in clay if you will, a victory. But the clay, to take the metaphor a bit further, is unwilling, at some level, to be formed. The genius of the commander must rein in the enemy, to control the clay so that he is able to shape it into whatever form he desires. Every contingency offers the commander a different medium, and so the degree of genius to be exercised by the commander will change.

Often thought of as Napoleon's greatest victory, the Battle of Austerlitz embodies Napoleonic genius at its classical best. Outnumbered 82,500 Austrians and Russians to 65,000 French, Napoleon still managed to bring about victory in grand style. Napoleon surveyed the strategic environment holistically, came to terms with the situation, and acted aggressively and quickly. He succeeded in keeping apart the full strength of an Austro-Prussian coalition by boldly attacking into the heart of Austria. He realized that if his force met with the concentrated entire Austro-Russian forces head-on the advantage in numerical strength held by his opponents would be overwhelming. But by keeping his enemy divided, Napoleon had the ability to realize victory through superior command and control and bold initiative. And, of course, he did.¹²⁵ The key is that the level of Napoleon's genius was contingent upon his

¹²⁵ Historical review taken primarily from lecture notes given by Professor R. H. S. Stolfi, 10 Jan 91 at The Naval Postgraduate School, Monterey, CA. Also helpful was

strategic environment. The environment does not constrain genius; it only defines the level of actualization.

The recent U. S. Operation Desert Storm is also an example of a degree of genius actualized, though this level of actualization is far below that of Napoleon as expressed on a qualitative continuum. General Norman Schwarzkopf without question led the United States and coalition forces to a great victory, or better put, an easy victory. The medium of Schwarzkopf's creation, or artistry seemed to be a willing one. The Iraqi forces did not offer any effective resistance in combat, nor did they display any significant degree of élan or initiative prior to hostilities. Though it could be argued that the execution of potent air strikes upon the enemy's positions prior to the commencement of the ground war demoralized the opposing army, thus breaking its will, there is a high probability that the Iraqi army was not sufficiently motivated to fight effectively in the first place. Schwarzkopf formed his clay, but one might question the fundamental nature of the clay he formed. The bottom line is simply that the level of genius necessary to win Desert Storm was not too high. This is not meant to trivialize the efforts of the men involved in the operation, only to demonstrate the variable role of the extraordinary intellect in war.

The more difficult the situation, the more genius is required to overcome the difficulties. The United States, because of its tremendous economic and political power, may not need to gain victory through the work of extraordinary genius in the future. Basic, solid intellectual capacity will

material from Russel F. Weigley, *The Age of Battles: The Quest for Decisive Warfare from Breitenfeld to Waterloo*, Bloomington, IN: Indiana University Press, 1991), 384-390.

likely suffice. The United States will drive the problem so that it is not in a situation at the outset of hostilities which would put it at an initial disadvantage, either qualitative or quantitative. But to reiterate, as genius is an attribute of man, and men alone are the creatures who take part in war, genius will always be a part of the equation. Art is the doing of men. Genius is found in men doing art.

V. CONCLUSION

What is War? Is it an art or a science? Is it something that somehow synthesizes the two? Is this an important question? These queries have been guiding this paper from the outset. But the emotions that have been giving energy to the the rationale are entirely different. The importance of Man in life and consequently, in War, seems to be in the process of becoming trivialized. A vitalistic, holistic view of life which has been celebratory of Man, has given way to a mechanistic, unimpassioned secularism. The part played in life by passion and emotion seems no longer to be as significant as it once was. Science no longer is equated with man's search for Truth. Instead, science is equated, tragically, and mistakenly, with its own artifacts. Since technology has played such a great part in all wars, and technological advances have given certain types of advantage to the innovators, it has come to fill the eye of the public and the military community. Science, as an institution is implicitly being equated with technological artifacts, and this is a grave error. Since technology is much in the public eye in terms of its military applications, especially after the recent Desert Storm operation, people are continuously calling War "scientific" because it involves state of the craft technology. This is absurd. Science is not an artifact, a thing; it is a unique process.

Art also is considered by most in the Western world to be defined in terms of its own artifacts as well. The role of Man in the scientific and artistic

endeavours has been ignored. One of the primary results of this paper, in a very broad sense, has been the re-revelation that Man is indeed, the driver of both Science and Art, that Man is the "rider" and the artifacts are the "horse." This point alone is a weighty message for the military officer to ponder, but the paper continues to show how this humanistic edge applies to War.

War, as defined today, encompasses so many tangential considerations that it has become useless as a descriptive term. As a result, a theoretical breakdown which would facilitate discussion had to be made. The broad notion of War was broken down into two separate branches—conduct of war and preparations for war. Preparations for war, which include such activities as strategic planning, programming and budgeting, congressional liaison, weapons procurement, training and the like are before the fact, before the Clausewitzian "cash transaction" of battle. They represent the "potential" in contrast to the "actual" of combat. Preparing for war is akin to the scientific dynamic. It is historical, and seeks to find the "right" way, or "best" way to do a certain thing. It displays the primacy of sublime genius, the genius of the scientific process. Indeed, war preparation is driven by the Man and Mind, but it reflects a special kind of work done by a special kind of mind.

Similarly, the conduct of war requires a special kind of genius as well. Instead of the primacy of sublime contemplation however, the conduct of war more intimately involves the primacy of heroic genius, or, the genius of

physical action, or "event-making" action.¹²⁶ To restate the fundamental point, "Art is doing."

In an 1st prize award winning essay (the Air University's Ira C. Eaker Award), LTC Dennis Drew states that the military art,

...is discovered through the study of military history...the study of military history provides insight into the evolution of strategic thought, the political and military objectives of warfare, the influence of technology on operational concepts...Thus the intelligent study of military history can provide a fundamental understanding of strategy, tactics, doctrine, political military relations, and leadership. Such are the elements of the military art.¹²⁷

This passage is indicative of the confusion which permeates the defense-intellectual community. These "elements of military art," as presented by Drew, with the exception of leadership, encompass an overly broad set of subjects which are in fact, within the framework of the theory presented in this paper, best considered under the rubric, Science. Indeed military history is and should be a critical focus of intellectual energy for any military man. History helps to reveal the chance, uncertainty, and friction which was met by the specific commander in the specific situation. No absolutes should be drawn from history, only examples of the Mind's relationship to both the tangibles and intangibles of a given situation. History can be used scientifically in attempting to better articulate a paradigm through the

126 The conception of a hero as an event-making man is borrowed from Siodney Hook as articulated in his *The Hero In History: A Study of Limitation and Possibility*, (Boston, MA: Beacon Press, 1943).

127 LTC Dennis M. Drew, "Military Art and the American Tradition: The VietNam Paradox Revisited," *Air University Review*, (Jan-Feb 1983).

corroboration or falsification of theory, but it does not reveal the elements of art. Art is the doing, not studying the "done."

Man is a curious beast. The Mind of Man, gifted with consciousness, is an infinitely faceted jewel. Mind gives direction, Mind controls action, Mind defines character and personality, and Mind may allow for the actualization of Genius. War is an Art and Science because both require Mind for their articulation.

Yet at a more focused level, war must be discussed in terms of its conduct and its preparation. In doing this, the common link of Mind and Genius can be further specified. Those who prepare for war are exercising the sublime mind. They are the thinkers and planners, detached and free from the passion of combat. Those men who conduct war are the doers, men that recognize the inherent intangibles in war, and that rise above them actively in order to accomplish their tasks. They are exercising the heroic mind. They witness the passion of combat and channel that energy to advantage.

That the defense institution involves two very different types of minds is no small message, though this fact has been implicitly known and accepted for years. This paper should help to understand better the relationships to be cultivated between scientific and artistic intellects.

More disturbing messages, however, are revealed upon further speculation. The question arises in looking at the training program set by each branch of the service: what kind of man is being trained for war? When training is looked at holistically, the services seem to be breeding preparers; perhaps more intellectual energy should be expended in finding ways to identify and enhance the warfighting capabilities of officers slated to conduct

war. And once identified, how are the war fighters trained? It is apparent that preparers have been well trained by a U. S. armed forces educational system with a cant in the direction of teaching officers about things, e. g. , plans, weapons, schedules, etc. But war fighters must undergo a different sort of training. If the war fighting soldiers of the future are to be event-making men who live and breathe beyond the rules they must be trained to let the mind roam free, to become exposed to the heady world of consciousness through reading and criticizing the masterworks and esoterica of philosophy, religion, history, and the like. If the Genius in battle is to live above the so-called absolutes in war (the "rules"), and exhibit characteristics of "creativity and originality to the highest power," then the soldier must be placed in an environment where he is compelled to do so.

Men of war need to be men of action. Action in war must be guided by a fundamental recognition and assimilation of all facets of the martial environment. Men of war are decisionmakers. Decisions must be made rapidly, and all implications thereof need to be recognized and addressed. Of course, not all decisions are simple ones. In order to decide boldly, the soldier must be able to, in an instant, manipulate, adjust, correct for, and/or ignore the myriad variables in war which are driven by chance and uncertainty. These variables run a range from the moral and physical disposition of one's forces and those of the enemy, to the weather, to the integrity of the logistics train. The capability to identify these discrete variables and manipulate them individually or *in toto* is derived from the flexible mind. The intellectual flexibility of the soldier must be a number one priority. This is achieved by introducing the mind to ideas that are new and different, and then forcing the

student to answer why the ideas are considered new and different, and if the answers represent valid conclusions. The critical mind is a flexible mind. A flexible mind is the mind for battle. For example, rather than asking a student to explain why the Germans lost WWII, ask him to comment upon why the Germans should have won the war in grand style. Rather than reading Clausewitz and rehashing the importance of his "famous" dictum, read Clausewitz and Hegel, then write about the similarity in style of argument. The possibilities are limitless. This type of training should occur at every level of the soldier's career, especially at the early stages. Changes are often made in organizations by the very new, and the very junior.

One can only imagine the effect that an introduction to William of Ockham, the 14th century churchman, would have upon the defense establishment. "Ockham's Razor," the age old principle of parsimony which said "Metaphysical entities are not to multiplied beyond necessity," would have profound effects upon a military with swollen staffs that create extraneous issues and shield general officers from direct contact with subordinate commanders. The problem is that the United States is the land of the current and fashionable. How can a medieval theologian be important to ComCarGru 2? He can, if believed to be important.

But intellectual excellence and a flexible mental capacity are only part of the requirements of a heroic genius. Excellence in physical operations must also be strived for. Real time, pressure-filled exercises must be conducted and decisions must be made. Men must be held accountable for these decisions. Entire operations must be reviewed and critiqued by participants and critics.

All decisionmakers must be forced to analyze their actions in more honest, intense and fundamental ways.

War requires two types of men— thinkers and doers. The relationship is symbiotic, but the emphasis must be placed on the latter. The thinkers support the doers. Preparations support the activity. If war is to be thought of as so broad as to include all of the aspects discussed previously, then indeed war can be classified as art and science. But if war is to be addressed in its most fundamental sense, as "an act of force to compel the enemy to do our will," as Clausewitz states, then it most certainly is an art. Men are creatures of passion and inspiration. Soldiers are men, and thus are a synthesis of passion, inspiration and reason, sometimes coldly critical in their thought, at times fiercely chaotic. War is a product of men, a product which is not beautiful, yet oddly, perhaps inevitable and intensely passionate. Men bring with them to war, the same energies which guide their lives. The soldier-genius recognizes the potential entrophy and acts to deal with it, and ultimately achieve victory. As a Rafael represents a vision on canvas, a Napoleon, with broad sweeps of a brush, also actualizes a vision.

The results of this paper are not particularly revolutionary, but reaching them has been intensely edifying for the writer. Intellectual history is a fascinating subject, and though this paper did not deal specifically with that topic, the messages contained herein must be considered in its intellectual context, just as the thinkers' addressed above need to be. As stated in the introduction, it is this writer's view that certain philosophical trends took the intellectual energy away from mainstream America and refocused it upon a materialist, pseudo-progressive ideal, rather than an intellectual one.

The tools of business management have made their way over to the military and have anesthetized organizations which should thrive on passion. Now America is a rich nation but does not know where to go next. One part of this paper's message is a call to look back within. The other part answers the question, "Why?"

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